

APPENDIX D

FILE REVIEW DOCUMENTS

GLASS BEACH REMEDIAL ACTION PLAN ADDENDUM, REMEDIAL ACTION PLAN & CORRESPONDENCE



RWQCB
REGION 1

SEP 09 2002

SEP 9/10/02

CITY OF FORT BRAGG

Incorporated August 5, 1889
416 N. Franklin St.
Fort Bragg, CA 95437
FAX 707-961-2802

☐ SAW ☐ FGR ☐ CCH
☐ RLT ☒ LGR ☐ KAD
☐ NPO ☐ RSG ☐ EJJ

copy & circulate to RLT

NOTICE OF AVAILABILITY AND
NOTICE OF INTENT TO ADOPT A NEGATIVE DECLARATION

NOTICE IS HEREBY GIVEN that the Fort Bragg Community Development Director has determined that the following project would not have a significant effect on the environment and a mitigated negative declaration has been prepared for the project.

PROJECT TITLE: Glass Beach Site Remediation; Coastal Development Permit #7-02

PROJECT LOCATION: 301 West Elm Street, Fort Bragg (Mendocino County)
(APN 008-020-24)

OWNER/APPLICANT: William J. Blinn Trust

REQUEST: Coastal Development Permit for implementation of a Remedial Action Plan (RAP) for the approximately 38-acre Glass Beach property. The RAP presents guidelines for remediation of the site through excavation of approximately 2,000 cubic yards of buried refuse and soils from several locations near the westerly terminus of site access roads which extend west from Elm Street. The project also includes the removal of two concrete retaining walls/abutments from the coastal bluff. Excavated materials will be transported to a Class I or Class II disposal facility. Excavation depths range from approximately 4-10 feet below the ground surface. All areas to be excavated, as well as staging and temporary soils/refuse stockpiling areas, will be temporarily fenced and secured. The site will be recontoured to eliminate hazardous embankments, to ensure continued public access routes, and to minimize potential erosion impacts. All work to be performed is above the mean high tide and within the City of Fort Bragg's coastal development permitting jurisdiction.

The draft mitigated negative declaration will be distributed to responsible and trustee agencies and made available for public review on September 5, 2002. Copies of all documents are available for review and/or copying during normal office hours at the Fort Bragg Community Development Department, City Hall, 416 North Franklin Street, Fort Bragg, CA, 95437. Prior to action on the coastal development permit, a public hearing will be held by the Planning Commission. All interested persons are invited to attend the public hearing and/or to submit written comments on the Negative Declaration to the Community Development Department by September 26, 2002. Questions regarding this matter may be directed to Associate Planner Jason Dose at (707)961-2827.


Linda Ruffing, Community Development Director

DATED/POSTED/PUBLISHED:
ADMINISTRATION/ENGINEERING
(707) 961-2823

September 5, 2002
FINANCE/WATER WORKS
(707) 961-2825

ECONOMIC/COMMUNITY DEVELOPMENT
(707) 961-2828



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REGION 1

SEP 09 2002

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<input type="checkbox"/> SAW	<input type="checkbox"/> FCR	<input type="checkbox"/>
<input type="checkbox"/> RLY	<input type="checkbox"/> LGR	<input type="checkbox"/> KAD
<input type="checkbox"/> HPO	<input type="checkbox"/> RSG	<input type="checkbox"/> EJI

ENVIRONMENTAL CHECKLIST FORM & DRAFT MITIGATED NEGATIVE DECLARATION

PROJECT TITLE: Glass Beach Site Remediation; Coastal Development Permit # 7-02

LEAD AGENCY: City of Fort Bragg
416 North Franklin Street
Fort Bragg, CA 95437

CONTACT: Fort Bragg Community Development Department
Jason Dose, Associate Planner
(707) 961-2827

LOCATION: 301 West Elm Street, Fort Bragg, CA (Mendocino County)
APN 008-010-24

OWNER: William J. Blinn Trust
1543 Lewiston Drive
Sunnyvale, CA 94087

**GENERAL PLAN
DESIGNATION:** Industrial (IND)

ZONING: Heavy Industrial (IH); Coastal Zone Combining Zone (CZ)

SITE DESCRIPTION AND HISTORY

The project site is a portion of an approximately 38-acre oceanfront parcel in northwestern Fort Bragg, California (See Attachments 1 and 2). The parcel is bounded on the north by Pudding Creek, on the south by the Georgia Pacific property, on the east by Glass Beach Drive, and on the west by the Pacific Ocean. The parcel is located within the eastern half of Section 1, Township 18N, Range 16W, Mount Diablo base meridian. The site is a relatively flat marine terrace with steep coastal bluffs near the shore. Remnant rock formations dot the shoreline and near off shore areas.

Between 1949 and 1967, the site was owned by the Union Lumber Company and was operated as a privately-owned dump. Household waste, scrap metal and automobiles were dumped over the edge of the bluff from two "tipping" areas. In both locations, concrete retaining walls were constructed to stabilize the bluff (Attachment 3 and Figures 1 and 2). On-site investigation has identified waste deposits along the shoreline, embedded within the bluffs, and accumulated in the gullies on the

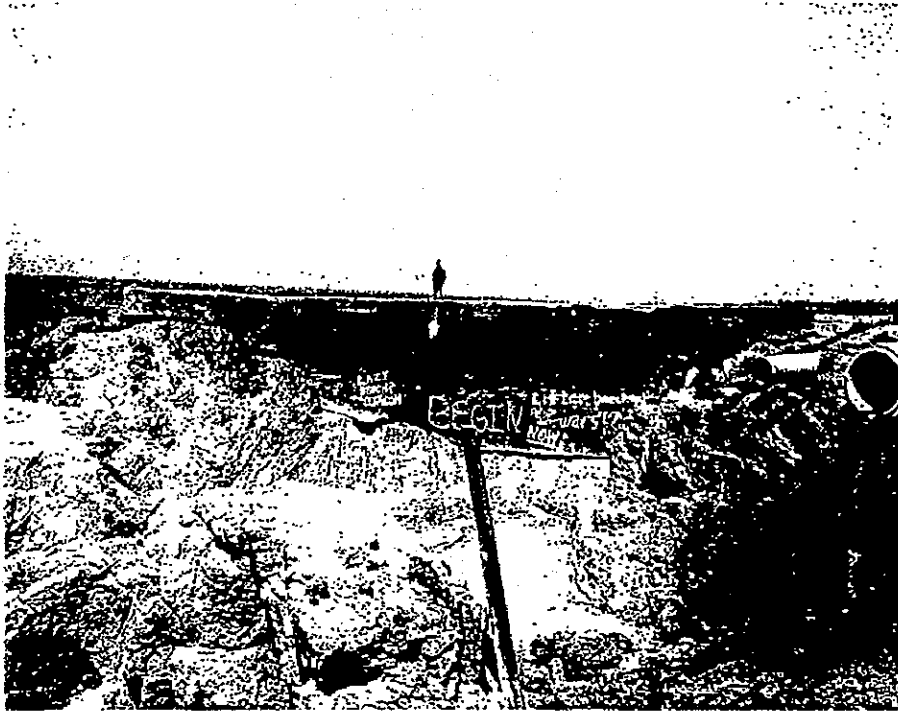


Figure 2. Photograph of the south retaining wall. City storm drain outfall pipes are visible to the right (east) of the retaining wall. Photograph taken looking north.



Figure 3. Exposed debris to be removed located in a small gulley to the west of the south retaining wall (the wall is visible in the upper right of the photograph). Photograph taken looking north.



Figure 6. Photograph of northernmost area to be remediated (just south of the seasonal creek). A majority of the area visible up to the tree in the center/right would be subject to excavation. Photograph taken looking northeast.

Title to the property was transferred from Union Lumber Company to Boise Cascade Lumber Company in 1969, and then to Georgia Pacific Corporation in 1973. The property was purchased by the present owner in 1991.

While the Glass Beach site is privately owned, it is visited annually by thousands of tourists and local residents who routinely pick through and collect the large amounts of beach glass which has been broken, washed, and polished by the tide. The property owner has made attempts to restrict access to the site, but has been directed through litigation filed in Mendocino County Superior Court by (among others) the Glass Beach Headlands Access Committee, the Noyo River Indian Council, the Mendocino Coast Audubon Society, the California Native Plant Society, and the Mendocino Area Parks Association to maintain coastal access to the public. There are several areas of exposed burn ash throughout the site, with metal fragments and potential lead exposure, causing immediate safety concerns.

The California Coastal Conservancy began the process of acquiring the property for permanent public use and beach access in the late 1990's. In September 2000, the Coastal Conservancy accepted \$2,500,000 of federal grant money under the Conservation Lands Share of the Transportation Enhancement Activities (TEA) program to aid in the acquisition of the Glass Beach Property. The Coastal Conservancy is prohibited from using the funds for remediation of the property as TEA grant funds can only be used for scenic or wildlife corridor acquisition and protection. Once purchased, State Parks has agreed to manage and operate the Glass Beach property as part of the adjacent MacKerricher State Park. In order for the acquisition and transfer to proceed, the site must be remediated to remove all hazardous materials. The California Integrated Waste Management Board

STATE OF CALIFORNIA)
)SS.
COUNTY OF MENDOCINO)

I declare under penalty of perjury, that I am employed by the City of Fort Bragg in the Community Development Department; and that I posted this Notice in the City Hall Notice case on September 5, 2002.

Nancy DeMartino
Nancy DeMartino, Administrative Secretary

southwestern portions of the property. The Remedial Action Plan (SHN, May 2002, and addendum, July 2002) illustrate areas with deposits of buried refuse (Attachment 4).



Figure 1. Photograph of the north retaining wall. Photograph taken looking northeast



Figure 4. Photograph of area to be remediated in gulley immediately south of the north retaining wall. Photograph taken looking southeast.



Figure 5. Photograph of exposed and embedded rubbish located just north of the north retaining wall. Photograph taken looking east.

(IWMB) proposes to perform a Board-managed remediation of the property with the IWMB paying for the estimated \$750,000 cost of performing the site clean up. The remediation is contingent upon the City completing the environmental review and coastal development permitting process.

In May 2002, the property owners prepared a Remedial Action Plan (RAP) (Attachment 4) which identifies remediation options for the site. An analysis of soil samples detected potentially hazardous concentrations of heavy metals in specific areas located in the southwestern portion of the site. The RAP identified three alternatives for remediation including:

1. Excavation of source areas with off-site disposal.
2. Limited excavation and capping of existing refuse areas with groundwater monitoring.
3. No Action.

Excavation of source areas with off-site disposal was selected as the preferred alternative, as "clean closure" of the dump site is anticipated to best comply with the Regional Water Quality Control Board's (RWQCB) requirements. The North Coast RWQCB will be the lead regulatory agency providing oversight of the remediation. RWQCB staff are preparing Waste Discharge Requirements for the project for consideration by the RWQCB.

PROJECT DESCRIPTION

Remediation of the Glass Beach property involves removal of wastes from the site sufficient to satisfy the RWQCB's "clean closure" requirements. Excavation equipment (excavator, water truck, dump trucks, etc.) will use the existing paved/gravel roadway along the southern boundary of the site and on-site staging will occur on existing paved/gravel areas near the two retaining walls. Prior to commencement of excavation, staging areas and excavation areas will be fenced to ensure general site safety and security.

The RAP identifies areas of proposed excavation based on soil borings and groundwater analysis (Attachment 4). Excavation will begin in the areas known to contain refuse and contaminants and continue in all directions until refuse and contaminants are no longer encountered. Once all of the obvious refuse material has been removed from a particular excavation area, the native material that underlies the refuse will be visually inspected by the contractor for staining or other discoloration, and materials will be field screened using an organic vapor analyzer (OVA) and field test kits. The visual inspection and the results of the field screening will be used to assess whether or not additional excavation should be conducted. It is expected that a total of approximately 2,000 cubic yards of material will be removed from the site. The RAP states that debris is located at depths varying from 2 to 11 feet below grade. Once a determination to stop excavation has been made, confirmation soil and water samples will be collected for submittal to a State of California certified analytical laboratory for chemical analysis. If the laboratory analysis indicates that contaminant levels do not meet RWQCB water quality goals, the contractor will contact RWQCB staff to establish an appropriate course of action to complete remediation in that specific area. All excavated materials will be transported to a Class I or II disposal facility based on the level of contamination present.

After all contaminated materials have been removed, excavated areas will be recontoured to eliminate any hazardous embankments, to ensure continued public access routes, and to minimize potential erosion impacts. Once the impacted areas have been recontoured, they will be replanted using native vegetation to restore the site to a more "natural" state.

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Two existing retaining walls on the site will also be removed, in preparation for transfer of the property to State Parks (See Attachment 3 and Figures 1 and 2). State Parks has indicated that the walls pose potential liability and maintenance issues and that they must be removed prior to acquisition of the property for public use. Some scattered debris will also be removed directly from the beaches around the proposed excavation areas and retaining walls to alleviate public hazards and to reduce potential liability issues. No work will occur on beach areas below the mean high tide line. All of the proposed excavation, refuse removal, and retaining wall removal areas are located within the City of Fort Bragg's jurisdiction for coastal development permits.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" or "Less than Significant with Mitigation Incorporated" as indicated by the checklist on the following pages:

- | | | |
|---|---|---|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agricultural Resources | <input checked="" type="checkbox"/> Air Quality |
| <input checked="" type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources | <input checked="" type="checkbox"/> Geology/Soils |
| <input checked="" type="checkbox"/> Hazards & Hazardous Materials | <input checked="" type="checkbox"/> Hydrology/Water Quality | <input type="checkbox"/> Land Use/Planning |
| <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise | <input type="checkbox"/> Population/Housing |
| <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation | <input type="checkbox"/> Transportation/Traffic |
| <input type="checkbox"/> Utilities/Service Systems | <input type="checkbox"/> Mandatory Findings of Significance | |

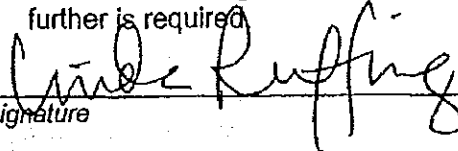
DETERMINATION (To be Completed by the Lead Agency)

On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been

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avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.


Signature

September 5, 2002
Date

Linda Ruffing, Community Development Director
Printed Name

City of Fort Bragg
For

ISSUES**I. Aesthetics**

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?				X
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c. Substantially degrade the existing visual character or quality of the site and its surroundings?				X
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				X

The project would result in a temporary aesthetic impact relating to the operation of construction equipment on site and the erection of fencing during site remediation activities. The areas which are proposed for remediation have been highly impacted through public use and activities relating to the historic dumping of refuse. At present, these areas are covered with non-native and invasive plants. The recontouring and replanting of excavated areas with native plants will improve both the biological and aesthetic qualities of the site. The removal of the retaining walls will also improve the aesthetic quality of the site's beaches, as they will be restored to a more natural state.

The temporary impacts to scenic resources associated with the remediation work are offset by the significant aesthetic enhancements which will result from site remediation.

II. Agricultural Resources

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X

The project site is located on a coastal terrace and the overlying soils are very sandy with minimal nutrients available. In addition, the site is subjected to high winds and salt spray, making it unsuitable for agricultural use. The site does not have a history of

agricultural use and is presently zoned for Heavy Industrial land uses. The proposed remediation activities would have no effect on agricultural land.

III. Air Quality

Where available, the significance criteria by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?		X		
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?				X
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?				X
d. Expose sensitive receptors to substantial pollutant concentrations?				X
e. Create objectionable odors affecting a substantial number of people?				X

Site excavation and grading activities may result in temporary increases in airborne dust emissions. These activities are subject to the conditions of Regulation 1, Rule 430 (Fugitive Dust Emissions) of the Mendocino County Air Quality Management District (MCAQMD). The following condition is recommended to ensure that adequate measures are taken to prevent fugitive dust emissions:

- ⇒ Demolition and grading activities are subject to the conditions of Regulation 1, Rule 430 (Fugitive Dust Emissions) of the MCAQMD. Proper dust suppression measures shall be undertaken during all phases of site remediation.
- ⇒ If asbestos materials are unearthed during site excavation, the contractor shall comply with OSHA requirements for asbestos handling, and the MCAQMD shall be notified per NESHAP requirements.

IV. Biological Resources

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?				X
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?		X		
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		X		
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				X
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

A Botanical Study was conducted by Ms. Teresa Sholars, Botanical Consultant, to evaluate the potential impacts of the proposed remediation on biological resources at the site (Glass Beach Botanical Study, July 2002, Attachment 5).

According to the Botanical Study, the Glass Beach property is comprised of three primary plant communities: North Coast Bluff Scrub, a willow-dominated wetland and riparian area, and a coastal prairie. The site is one of the few intact North Coast Bluff Scrub plant communities in northern California and it contains seven "sensitive" plant species, all of which occur north of the unnamed intermittent creek and outside of the areas upon which proposed remediation would occur (See Attachment 3 for remediation locations). The creek forms the northernmost boundary of the proposed remediation areas and the sensitive species would be undisturbed by site remediation. All of the areas to be remediated are highly disturbed and non-native, invasive plants have displaced the natural vegetation.

A portion of the northernmost debris area which is identified for remediation may encroach into an existing copse of willows which forms a riparian/wetland area immediately south of the unnamed seasonal creek. The Botanical Study states that the long-term benefit of removing the hazardous materials and exotic/invasive plants from the site will far outweigh the short term impacts to the overall plant community and riparian/wetland areas.

To offset potential impacts to botanical resources on the site and to minimize the effects of erosion, the following mitigation is recommended:

- ⇒ All site areas which are disturbed by remediation activities shall be revegetated with native plant species that already occur on the site. Revegetation activities shall be conducted and/or overseen by a qualified botanist in accordance with all common approved methods and techniques. Cuttings, division, and transplantation of the following species are recommended (list adapted from T. Sholars "Preliminary Botanical Field Survey for Glass Beach, July 25, 2002):

<i>Angelica hendersonii</i>	Angelica
<i>Eriophyllum lanatum</i> var. <i>arachnoideum</i>	
<i>Erigeron glaucus</i>	Seaside Daisy
<i>Grindelia stricta</i> var. <i>platyphylla</i>	Gum Plant
<i>Heterotheca sessiliflora</i> ssp. <i>Bolanderi</i>	Golden-aster
<i>Armeria maritime</i> ssp. <i>Californica</i>	Sea Pink Thrift
<i>Erigonum latifolium</i>	Coast Buckwheat
<i>Fragaria chiloensis</i>	Beach Strawberry
<i>Potentilla anserina</i> ssp. <i>Pacifica</i>	Cinquefoil
<i>Iris douglasiana</i>	Douglas Iris
<i>Sisyrinchium bellum</i>	Blue-eyed Grass
<i>Sisyrinchium californicum</i>	Golden-eyed Grass
<i>Bromus carinatus</i> var. <i>maritimus</i>	California Brome
<i>Hordeum brachyantherum</i>	

It is recommended that revegetation of the impacted areas be performed between the months of November and February to allow for natural precipitation to help establish the new plantings.

Because the site remediation project will have a beneficial impact on plant and wildlife resources on the site, staff recommends that the "de minimus" finding be made, thereby exempting the project from the Department of Fish & Game filing fees.

V. Cultural Resources

<i>Would the project:</i>	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
<i>a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?</i>				X
<i>b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?</i>				X
<i>c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?</i>				X
<i>d. Disturb any human remains, including those interred outside of formal cemeteries?</i>				X

An Cultural Resources Investigation was conducted by Thad Van Bueren, M.A (August 2002). It does not identify any sensitive archaeological or historic resources on the site areas which will be disturbed by remediation. Because the report contains sensitive information that is exempt from public disclosure under both state and federal law (i.e., it contains information identifying location of archaeological remains), it is treated as confidential and is not attached to this Mitigated Negative Declaration.

The proposed remediation site contains archaeological site CA-MEN-1401H which encompasses the portions of the site which were used for refuse dumping between 1949 and 1967. The consulting archaeologist determined that the site does not qualify as a historic resource when judged in accordance with Section 15064.5(a)(2-3) of the CEQA Guidelines, using the criteria outlined in Public Resources Code, Section 5024.1. Although the use of the dump site began more than 50 years ago and the site contains abundant archaeological materials, it does not appear to qualify as a historical resource for purposes of CEQA compliance for several reasons. The ability to analyze remains from this dump in a way that will significantly add to historical knowledge is severely compromised by the mixing of historic and more modern materials. Physical observation of cut banks at the site reveals no clear stratification that might serve as a basis for distinguishing earlier from later soil strata. This is understandable, given that the formation of the deposits was subject to ongoing disturbance from wave action, regular burning, and scavenging activities both at the time the deposits were created and in subsequent years. The ability to identify and interpret materials in the refuse deposits have also been compromised by disturbance, corrosion, and compaction/breakage, which have reduced a large part of the assemblage into a fragmentary, melted, or otherwise unidentifiable condition. The site's poor state of physical preservation reduces the ability to meaningfully interpret the site deposits and the behavior they reflect. For these reasons, CA-MEN-1401H does not appear to contain deposits that can be effectively used to address historical research and fails to meet the criteria of eligibility as a historical resource when judged in relation to criteria defined in Section 5024.1 of the California Public Resources Code.

The survey found no evidence of any prehistoric remains within the surveyed areas. However, a previously recorded prehistoric site (CA-MEN-1821) and the Pudding Creek Trestle are located in proximity to the site.

While the project is not expected to have a significant impact on archaeological or historical resources, the following mitigation is recommended to ensure that cultural resources, if unearthed during excavation, are properly handled and addressed:

- ⇒ In the event prehistoric archaeological resources (marked by shellfish remains, flaked and ground stone tools, fire affected rock, human bone, or other related materials) are unearthed during site excavation and grading activities, all work in the vicinity of the site should be halted immediately until a professional archaeologist can examine the finds to determine a suitable course of action.

VI. Geology and Soils

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii. Strong seismic ground shaking?			X	
iii. Seismic-related ground failure, including liquefaction?				X
iv. Landslides?				X
b. Result in substantial soil erosion or the loss of topsoil?		X		
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X	
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e. Have soils incapable of adequately supporting the use of septic tanks or alternative water disposal systems where sewers are not available for the disposal of waste water?				X

A Geotechnical Study was prepared for the remediation project (BACE Geotechnical, August 2002, Attachment 6). The Geotechnical Study evaluates potential impacts associated with removal of the retaining walls and potential issues related to slope stability and erosion.

The Geotechnical Study identifies site geologic and soil conditions as follows:

"The site bedrock exposed on the bluff faces and the offshore rocks in the site vicinity consists of Cretaceous-Tertiary Period coastal belt Franciscan Complex sedimentary rocks. These rocks primarily consist of sandstone and shale with minor chert. The bedrock is brown, gray and dark gray, little to closely fractured, moderate in hardness to hard, and moderate to little weathered.

"There is a consistent, northwest-trending strike where bedding is exposed within the Franciscan complex rocks. This accounts for the northwest linear trend of most of the peninsulas and offshore rocks in the vicinity. [...] Several, inactive fault traces were observed within the Areas I and II bluffs. The northwest-trending faults consist of near vertical zones of sheared rock, several inches to several feet wide. None of the published references that we reviewed identified faults on, or trending towards the property.

"The bluffs at the north end of the study area are covered with approximately three feet of poorly consolidated Pleistocene Epoch terrace deposits. The terrace sediments were deposited on wave-cut platforms during sea level fluctuations caused by periods of glaciation. These sediments consist of light brown silty sand with some sandy silt and gravel. No terrace deposits were observed on the bluffs elsewhere on the site.

"No landslides were observed in the study area. Erosion is occurring within the weaker rock zones and fill soils on the bluff faces. Rusty metal debris are being eroded from the fill deposits. Surface water runoff during the rainy season appears to be flowing over the bluff edges at several locations; thereby eroding the fill and native soils and deeply weathered rock."

The Geotechnical Study estimates the natural rate of erosion on the "undisturbed" peninsulas at approximately one to two inches per year. These hard rock points are erosion-resistant. By contrast, portions of the debris-filled bluffs have significantly higher erosion rates. One bluff, located at the north end of the Area II retaining wall, has retreated approximately 40 to 45 feet since 1963. The bluffs located south of the seasonal creek channel have been eroded approximately 30 to 35 feet during the same time period. Based on this, the average erosion rate for the disturbed areas on the bluffs is approximately 10 to 12 inches per year. The Study notes that, as the bluffs erode further back, they are less often reached by the ocean waves and the present retreat rate may be gradually diminishing.

The Geotechnical Study concluded that the area of potential instability are the areas which comprise the debris-filled portions of the bluffs. The removal of the debris, as part of the remediation work, will help to stabilize the bluffs, by removing the materials which are most susceptible to erosion.

The Geotechnical Study determined that the retaining walls do not have footings (See Figures 1 and 2). The south retaining wall has several voids both under and behind the wall.

The Geotechnical Study evaluated potential issues related to the stability of two existing City storm drain outfall pipes which are located immediately east of the south retaining wall. The study determined that removal of the retaining wall would not undermine or otherwise adversely affect the City's storm drain outfalls. The rocks exposed by the wall removal should erode at the "natural" average rate of two to three inches per year. Storm waves should not be adversely deflected by the wall removal toward the outfall. Some of the debris in the splash area below the pipes is cemented by rust. If this debris is removed, some of the natural rock may be displaced, possibly increasing the erosion rate, and in time, undermining the pipe outlets.

To ensure that site remediation activities do not result in adverse or accelerated erosion conditions, the following mitigation is recommended:

- ⇒ Debris removal operations should be observed by a qualified soils engineer or geologist to ensure that erosion-susceptible soils and loosened rocks are removed from areas exposed to wave action.
- ⇒ Except for removal of hazardous objects, the rust-cemented debris under the City's storm drain pipes should remain for erosion protection.

VII. Hazards and Hazardous Materials

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport, would the project result in a safety hazard for people residing or working in the project area.				X
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X

The proposed project involves the removal of potentially hazardous solid materials and soils contaminated with heavy metals on the site. While the excavation and removal of materials could result in potential short-term exposure of people to hazardous materials, the remediation project will be undertaken by a licensed operator and overseen by IWMB staff. It will be conducted in accordance with established standards and requirements which are intended to ensure the proper handling and disposal of hazardous materials. The proposed remediation project will enhance the safety of the site which is used extensively for public access and recreational purposes.

VIII. Hydrology and Water Quality

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements?			X	
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				X

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				X
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				X
f. Otherwise substantially degrade water quality?		X		
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j. Inundation by seiche, tsunami, or mudflow?				X

The project involves the removal of approximately 2,000 cubic yards of contaminated materials and soils from the site. The RAP provides a detailed evaluation of existing groundwater conditions associated with the dump site. Water quality issues resulting from the remediation work, including potential sedimentation or contaminated runoff entering the ocean will be addressed by the Regional Water Quality Control Board (RWQCB) through the establishment of Waste Discharge Requirements (WDRs) for the project. The RWQCB also requires a complete Report of Waste Discharge (ROWD) for the project. The applicant is responsible for coordinating with RWQCB staff to establish the appropriate protocol for handling materials on site. To ensure the appropriate plans/paperwork are filed, the following mitigation measures are recommended:

- ⇒ Prior to commencement of work on the site, the applicant shall submit a soil handling work plan for the review and approval of the RWQCB. The plan shall illustrate how exposed soils will be secured and maintained to prevent sediment runoff and landsliding during the entirety of the project.
- ⇒ Prior to the commencement of any work on the site, the applicant shall complete and file the required ROWD with the RWQCB.

IX. Land Use and Planning

<i>Would the project:</i>	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. <i>Physically divide an established community?</i>				X
b. <i>Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?</i>				X
c. <i>Conflict with any applicable habitat conservation plan or natural community conservation plan?</i>				X

The project site is located in the Heavy Industrial zoning district and is privately owned. The site has been used historically as a dump and, since 1967, it has been utilized for beach access and open space.

The project would help fulfill two goals of the current General Plan of the City of Fort Bragg including;

Section III (B), Goal 2, Objective 5: "To encourage tourism and the support activities identified with visitor attractions and services"

Section III (D), Goal 1, Objective 2: "To create safe, quiet, healthy and attractive residential neighborhoods with nearby employment centers, shopping and community services, and a system of internal and perimeter open spaces, parks and recreational facilities"

The project also helps to fulfill the coastal access objectives of the City's certified Local Coastal Program which address the need of public access to Glass Beach (LCP Policies III-3, III-4, III-5, III-6, III-7 and III-8).

The project site is one of the few areas within the city limits of the City of Fort Bragg with direct pedestrian access to the ocean. The proposed acquisition of the private property for public access would ensure the long-term public access to the coast at Glass Beach. The proposed remediation of the site is the first step in this process.

X. Mineral Resources

<i>Would the project:</i>	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. <i>Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?</i>				X
b. <i>Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?</i>				X

The site does not contain any known mineral resources.

XI. Noise

Would the project result in:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				X
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?				X
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

The proposed remediation project would occur approximately 750 feet from the nearest residences which are on the east side of Glass Beach Drive. The property is zoned for Heavy Industrial uses but no noise generation occurs on site. While the project will result in temporary increases in noise levels in the vicinity due to the operation of heavy equipment, the relative distance of the site from residential uses and the on-going ambient noise due to coastal wave action will make potential noise impacts less than significant. The work is subject to the City of Fort Bragg Noise Ordinance (FBMC Chapter 9.44) which limits the operation of heavy equipment on properties adjoining residential uses to the hours between 7:00 a.m. and 10:00 p.m.

September 5, 2002

XII. Population and Housing

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

The proposed project would not induce population growth either directly or indirectly. It does not involve the development of new housing units or the displacement of existing units. The site is presently zoned for Heavy Industrial uses, and if acquired for public use, would be reclassified to Parks and Recreation.

XIII. Public Services

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
Fire protection?				X
Police protection?				X
Schools?				X
Parks?				X
Other public facilities?				X

The project would not result in increased demands for public services.

XIV. Recreation

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X

September 5, 2002

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

The project site is currently privately owned, but is used extensively by the public for coastal access. Funds have been allocated through the Conservation Lands Share of the TEA program for the acquisition of the property. Upon transfer of ownership, it will be managed and operated as part of MacKerricher State Park. The remediation project is necessary to prepare the site for public acquisition. The project will have a substantial positive impact on recreational resources in the area.

XV. Transportation/Traffic

Would the project result in:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections?)				X
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?				X
c. Result in a change in traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?			X	
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e. Result in inadequate emergency access?				X
f. Result in inadequate parking capacity?				X
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X

The proposed project would result in a temporary increase in truck traffic to and from the site as excavated materials are removed from the site. Trucks would enter and exit the site off the west end of Elm Street. Trucks would enter onto Main Street (State Highway 1) at the signalized intersection of Main Street and Elm Street. The impacts would be temporary and short-term and are not considered significant.

To minimize potential traffic impacts, Caltrans recommends the following mitigations:

September 5, 2002

- ⇒ To the maximum extent feasible, truck traffic associated with the remediation work shall be scheduled to occur during non-peak traffic periods.
- ⇒ The number of outbound hauling trips shall be limited to 10 trips an hour or less.

The potential effects of truck traffic on local and regional roadways would be temporary and short-term. While the above mitigations are recommended, they are not required to mitigate a significant impact.

XVI. Utilities and Service Systems

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				X
g. Comply with federal, state, and local statutes and regulations related to solid waste?				X

The project would have no effect on water, wastewater treatment, storm drainage, or solid waste disposal facilities.

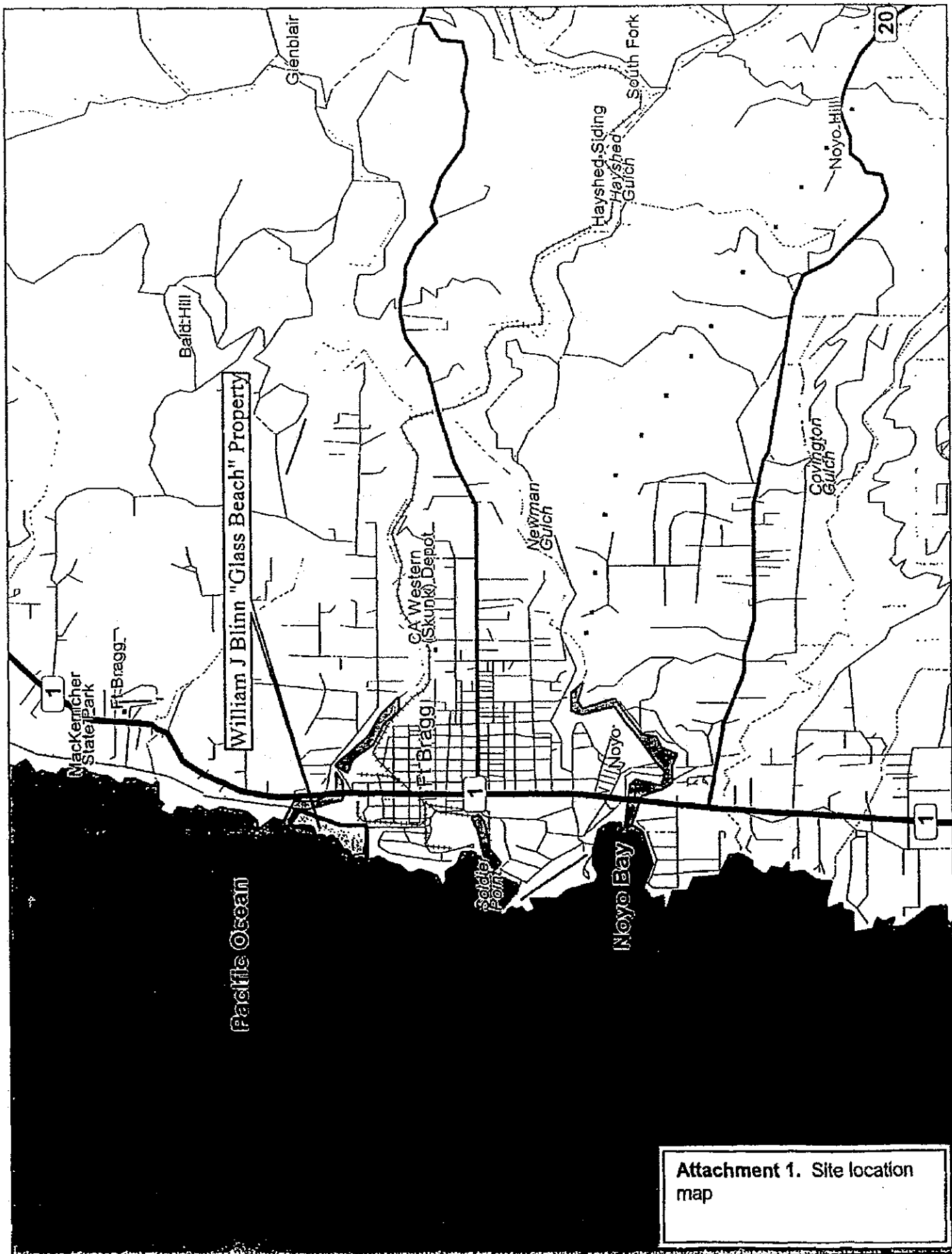
XVII. Mandatory Findings of Significance

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. <i>Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?</i>				X
b. <i>Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?</i>				X
c. <i>Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?</i>				X

The project involves the removal of approximately 2,000 cubic yards of buried refuse and contaminated soils from the Glass Beach site. The long term positive effects of the project far outweigh the short-term, temporary impacts associated with the remediation work.

ATTACHMENTS

1. Site location map
2. 1998 aerial photograph of the site
3. Site plan drawn from the 1998 aerial photograph
4. Remedial Action Plan
5. Botanical Survey
6. Geotechnical Study
7. Request for Comments and Agency Comments Received

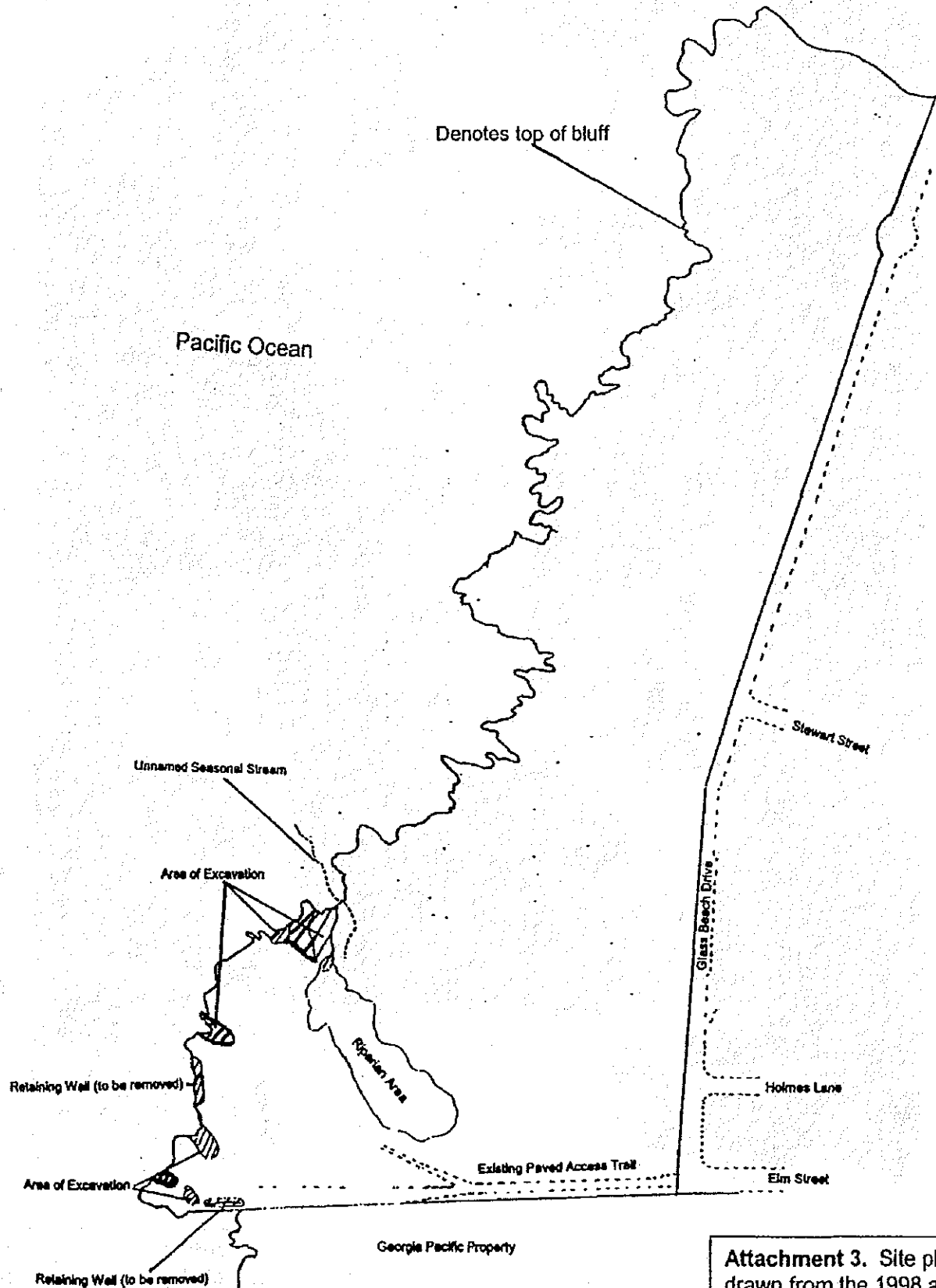


Attachment 1. Site location map



Attachment 2. 1998 aerial photograph of the Glass Beach site.

William Blinn Trust Property (Glass Beach)



Attachment 3. Site plan,
drawn from the 1998 aerial
photograph.



REMEDIAL ACTION PLAN

GLASS BEACH PROPERTY
FORT BRAGG, CALIFORNIA
RWQCB CASE No. 1NMC447

RECEIVED

MAY 21 2002

Prepared for:

CITY OF FORT BRAGG
PLANNING DEPT.

WILLIAM J. BLINN TRUST



Consulting Engineers & Geologists, Inc.

812 W. Wabash
Eureka, CA 95501-2138
707-441-8855

Attachment 4. Remedial
Action Plan

May 2002



California Regional Water Quality Control Board

North Coast Region

William R. Massey, Chairman

Winston H. Hickox
Secretary for
Environmental
Protection

Internet Address: <http://www.swrcb.ca.gov/rwqcb1/>
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone: 1 (877) 721-9203 (toll free) • Office: (707) 576-2220 • FAX: (707) 523-0135



Gray Davis
Governor

August 9, 2002

Mr. David Blinn
The Blinn Trust
1543 Lewiston Drive
Sunnyvale, CA 94087

Dear Mr. Blinn:

Subject: Remedial Action Plan Addendum

File: Glass Beach Property, West Elm Street, Fort Bragg, CA - Case No. 1NMC447

Thank you for the addendum to the Remedial Action Plan from SHN Consulting Engineers & Geologists, Inc. Regional Water Board staff have reviewed the addendum and concur with the Remedial Action Plan and addendum, with the following comments:

- The soil samples from borings SB-120, SB-123, SB-126, and SB-130 that were submitted for laboratory analyses were from the sand layer under the debris noted in the boring logs and not from the debris or fill.
- Since this project may extend into the wet weather season, the soil handling workplan to be submitted before the start of work should address stormwater management.

A response to these comments does not need to be submitted.

Regional Water Board staff are preparing Waste Discharge Requirements (WDRs) for this project for consideration by the Regional Water Board. A complete Report of Waste Discharge for the project is necessary. The Remedial Action Plan with the addendum constitutes the project description. To complete the ROWD, please submit a completed Form 200 (enclosed) for this project to this office. The classification of this project in regards to the fee schedule for WDRs is Chapter 15 III-b (i.e., Chapter 15 program, category III threat to water quality, category b complexity). The fee for this classification is \$1500 and will be used to pay for staff time preparing the WDRs. Staff time spent preparing this item for consideration by the Regional Water Board will not be charged to your cost-recovery account. Please submit a check for the fee amount with the completed Form 200. The check should be made out to the State Water Resources Control Board.

California Environmental Protection Agency



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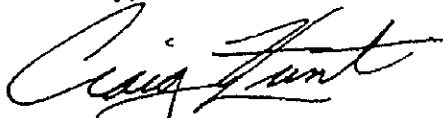
Mr. Blinn

- 2 -

August 9, 2002

I will contact you regarding the details of Form 200. If you have any questions, please contact me at (707) 570-3767.

Sincerely,



Craig Hunt
Water Resource Control Engineer

CSH:clh/GlassBeach0208

Enclosure: Form 200

Cc: Robert D. Armitage, Penitenti/Petersen Realty, Inc., 720 S. Main Street, Box 579, Fort Bragg, CA 95437
Frans Lowman, SHIN Consulting Engineers & Geologists, Inc., 812 W. Wabash, Eureka, CA 95501-2138
Moir McEnespy, California State Coastal Conservancy, 1330 Broadway, 11th Floor, Oakland, CA 94612-2530
Roger Sternberg, Mendocino Land Trust, P.O. Box 1094, Mendocino, CA 95460
Lono Tyson, California Integrated Waste Management Board, 1001 "I" Street, P.O. Box 4025, Sacramento, CA 95812
Dave Koppel, Mendocino County Environmental Health Department, 501 Low Gap Road, Room 1326, Ukiah, CA 95482
John P. Morley, Mendocino County Environmental Health Department, 501 Low Gap Road, Room 1326, Ukiah, CA 95482
Dave Goble, Public Works Department, 416 N. Franklin Street, Fort Bragg, CA 95437
Greg Picard, California Department of Parks and Recreation, P.O. Box 440, Mendocino, CA 95460
Mike August, California Department of Parks and Recreation, P.O. Box 942896, Sacramento, 94296-0001
Pat Rogers, California Department of Parks and Recreation, Office of Acquisition and Planning, 1 Capitol Mall, Suite 500, Sacramento, CA 95814-3245
Connie Jackson, City Manager, City of Fort Bragg, 416 N. Franklin Street, Fort Bragg, CA 95437
Vinda Ruffing, Community Development Department, City of Fort Bragg, 416 N. Franklin Street, Fort Bragg, CA 95437
Diana Stuart, Glass Beach Headlands Access Committee, P.O. Box 769, Fort Bragg, CA, 95437

California Environmental Protection Agency



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JUL 22 2002



CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash • Eureka, CA 95501-2138 • 707-441-8855 • Fax 707-441-8877 • info@shn-eureka.com

Reference: 099215

July 17, 2002

Mr. Craig Hunt
California Regional Water Quality Control Board, North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403

RECEIVED

JUL 24 2002

FORT BRAGG
PLANNING DEPT.

**SUBJECT: REMEDIAL ACTION PLAN ADDENDUM, GLASS BEACH PROPERTY,
FORT BRAGG, CALIFORNIA; RWQCB CASE NO. 1NMC447**

Dear Mr. Hunt:

SHN Consulting Engineers & Geologists, Inc. (SHN) has prepared this response addressing concerns that the California Regional Water Quality Control Board, North Coast Region (RWQCB) has raised in regards to the site Remedial Action Plan (RAP) prepared by SHN, dated May 2002. This addendum was prepared based on a discussion between the RWQCB and SHN during a phone conversation on July 9, 2002.

Responses to each RWQCB comment are listed below along with the RWQCB comment, which is presented in *italics*.

- *The purpose of the Plan should be clarified. It is widely recognized that the purpose of remedial action at the former dump at Glass Beach is complete removal of wastes, or clean closure. As stated in section 4.0 of the report, this Plan is for "excavation of source areas with off-site disposal."*

The purpose of the remedial action is the removal of sufficient waste from the site to satisfy clean closure requirements. This includes the removal of the major waste cells identified in the RAP along with the waste encountered in boring SB-4, and buried refuse that may be present to the north of the bluff in Area II. In order to effectively remove the existing waste from the site, excavation in each area will be started at locations known to contain refuse. Excavation will continue in all directions until the waste material has been removed.

- *Regional Water Board staff do not require backfilling to be performed for this project. Final re-grading or restoration of the excavations shall be part of any future use plan.*

Although backfilling is not required, SHN recommends that, at a minimum, the sidewalls of the excavations be sloped for safety reasons.

- *The confirmation sample spacing is appropriate.*

No comment required for this item.

- *Cleanup levels in soil of 100 mg/kg for TPH-d and TPH-mo, and 50 mg/kg for lead were proposed. In compliance with Title 27 s21090 of the California Code of Regulations, upon completion of remedial action it will be necessary to demonstrate that any remaining detections do not represent a threat to water quality.*

As part of the confirmation sampling schedule outlined in the RAP, each confirmation sample will be analyzed for total petroleum hydrocarbons as diesel (TPHD), total petroleum hydrocarbons as motor oil (TPHMO) and lead as proposed in the RAP. Additionally, soil samples that contain TPHD, TPHMO or lead at concentrations exceeding the proposed cleanup levels will be tested as follows. Lead samples that exceed the proposed cleanup level will be analyzed using a modified waste extraction test (WET) using de-ionized water as the leaching agent. TPHD and TPHMO samples that exceed the proposed cleanup levels will be tested for leachability using de-ionized water as the leaching agent. The WET/leachability test results will be compared to established water quality goals for each constituent. If the test results exceed water quality goals, then the RWQCB will be consulted to establish an appropriate course of action.

- *A detailed plan for the storage and removal of soil should be submitted for review before work is begun. This plan would not have to be included in the response to these comments.*

The requested plan will be submitted prior to the start of work.

- *It was stated in Section 4.1 of the Plan that the areas would be excavated down to approximately two feet below the refuse zones or to bedrock. There was no elaboration on how the value of two feet was obtained or be used. The depth of the excavation can be based on the results of the investigation, observations at the time of excavation, and the confirmation sampling. A minimum depth of over-excavation is not necessary.*

As suggested, the extent of excavation work will be based on the results of the investigation, observations made at the time of excavation and the results of confirmation sampling.

- *Clarification is necessary on how information in the form of visual inspection would be used to decide where to stop excavation.*

Excavation will be started in areas known to contain refuse, and will continue in all directions until the waste material has been removed. It is expected that there will be a clear distinction between the refuse material and native soil/bedrock. Once all of the obvious refuse material has been removed from a particular excavation area, the native material that underlain the refuse will be visually inspected for staining or other discoloration, and will be field screened using an organic vapor analyzer (OVA) or field test kits. The visual inspection along with the results of the field screening will be used to assess whether or not additional excavation should be conducted. Once a determination to stop excavation has been made, confirmation samples will be collected for submittal to a State of California certified analytical laboratory for chemical analysis.

- *The proposed excavation areas shown in Figures 3 and 4 do not appear to be based upon the extent of refuse found with previous investigations. Debris was noted on the boring logs for borings SB-105B, SB-108B, SB-120, SB-121, SB-123, SB-126, and SB-130. Elevated concentrations of lead and TPH-mo were found in samples from boring SB-4. The proposed excavations do not encompass these borings. Additionally, visual observations of the bluff from the beach indicate that buried refuse extends north from the proposed excavation in Area II. No justification was given in the Plan for exclusion of these areas from excavation.*

In order to effectively remove the existing waste from the site, excavation in each area will be started at locations known to contain refuse. Excavation will continue in all directions until the waste material has been removed. In Area I, borings SB-105B and SB-108B are immediately adjacent to the proposed excavation area, and using the proposed methodology will result in the inclusion of these locations in the excavated area. In Area II, the location of boring SB-4 was not originally included as a proposed excavation area because based on additional site work conducted around SB-4 it appeared that the extent of impacted soil was very limited. However, due to concerns raised by the RWQCB, this area will be included as an excavation area. In regards to comments regarding borings SB-120, SB-123, SB-126 and SB-130, while debris was noted in these borings, TPHD, TPHMO and lead concentrations found in these borings were either very low (well below the proposed cleanup levels for all constituents) or not detected. Due to the uncontrolled nature of the operation of the former dump, it is very likely that there is buried debris scattered throughout the site. However, as shown by laboratory analytical results, the scattered debris found in borings SB-120, SB-123, SB-126 and SB-130 poses no threat to water quality. The proposed methodology of beginning excavation within the known refuse cells and moving out until the waste material has been removed will be utilized.

- *In section 4.1.3 of the Plan, it was stated that the anticipated maximum depth of excavation for Area II would be approximately 7 feet. However, debris was noted at 11 feet below ground surface in boring SB-127, which is within the proposed excavation area. No justification was given for the exclusion of this refuse from the excavation.*

The use of the proposed methodology for excavation will address this concern. However, in order to ensure that all debris at the location of boring location SB-127 is removed, the excavation in this location will be extended to 11 feet below ground surface. An inspection of the extended excavation at this location will be used to assess whether or not additional deep excavation (to 11 feet below ground surface) will be needed.

- *In section 5.3 of the Plan it was stated that "Up to 2,000 cubic yards (yd³) of soil and rubbish may be excavated from the proposed areas." Stopping excavation at a certain volume rather than the limits of refuse and contamination as found through the investigation and as found during the excavation will not satisfy clean closure requirements.*

Sufficient excavation will be conducted to satisfy clean closure requirements at the site.

Mr. Craig Hunt
Remedial Action Plan Addendum, Glass Beach Property
July 17, 2002
Page 4

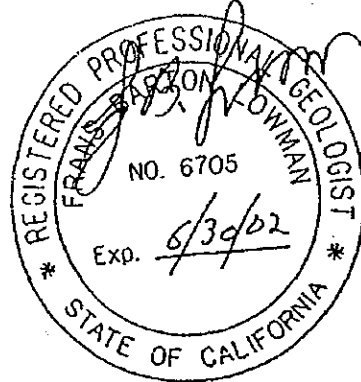
Please do not hesitate to contact me at 441-8855 with any questions you may have.

Sincerely,

**SHN CONSULTING ENGINEERS
& GEOLOGISTS, INC.**



Frans Lowman, R.G.
Senior Project Manager



FBL:dmm

c: William J Blinn Trust, Mr. David Blinn, Trustee
Robert Armitage
Lono Tyson, California Integrated Waste Management Board
Moira McEnespy, California Coastal Conservancy
Roger Sternberg, Mendocino Land Trust
Linda Ruffing, City of Fort Bragg

Attachment 1. RWQCB Correspondence

ATTACHMENT 1

RWQCB CORRESPONDENCE



California Regional Water Quality Control Board

North Coast Region

William R. Massey, Chairman

Justin H. Hickox
Secretary for
Environmental
Protection

Internet Address: <http://www.swrcb.ca.gov/rwqcb1/>
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone: 1 (877) 721-9203 (toll free) • Office: (707) 576-2220 • FAX: (707) 523-0135



Gray Davis
Governor

June 24, 2002

Mr. David Blinn
The Blinn Trust
1543 Lewiston Drive
Sunnyvale, CA 94087

REC'D JUN 26 2002

Dear Mr. Blinn:

Subject: Remedial Action Plan

File: Glass Beach Property, West Elm Street, Fort Bragg, CA - Case No. 1NMC447

Thank you for the Remedial Action Plan from SHN Consulting Engineers & Geologists, Inc (the Plan). Regional Water Board staff have reviewed the Plan and have the following comments:

- The purpose of the Plan should be clarified. It is widely recognized that the purpose of remedial action at the former dump at Glass Beach is complete removal of wastes, or clean closure. As stated in section 4.0 of the report, this Plan is for "excavation of source area with off-site disposal".
- Regional Water Board staff do not require backfilling to be performed for this project. Final regrading or restoration of the excavations shall be part of any future use plan.
- The confirmation sample spacing is appropriate.
- Cleanup levels in soil of 100 mg/kg for TPH-d and TPH-mo and 50 mg/kg for lead were proposed. In compliance with Title 27, §21090 of the California Code of Regulations, upon completion of remedial action it will be necessary to demonstrate that any remaining detections do not represent a threat to water quality.
- A detailed plan for the storage and removal of soil should be submitted for review before work is begun. This plan would not have to be included in the response to these comments.
- It was stated in section 4.1 of the Plan that the areas would be excavated down to approximately two feet below the refuse zones or to bedrock. There was no elaboration on how the value of two feet was obtained or would be used. The depth of excavation can be based on the results of the investigation, observations at the time of excavation, and the confirmation sampling. A minimum depth of over-excavation is not necessary.
- Clarification is necessary on how information in the form of visual inspection would be used to decide where to stop excavation.
- The proposed excavation areas shown in Figures 3 and 4 do not appear to be based upon the extent of refuse found with the previous investigations. Debris was noted in the boring logs

California Environmental Protection Agency



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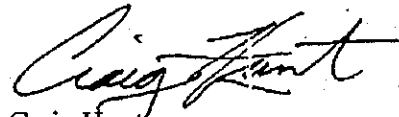
June 24, 2002

for borings SB-105B, SB-108B, SB-120, SB-121, SB-123, SB-126, and SB-130. Elevated concentrations of lead and TPH-mo were found in samples from boring SB-4. The proposed excavations do not encompass these borings. Additionally, visual observations of the bluff from the beach indicate that buried refuse extends north from the proposed excavation in Area II. No justification was given in the Plan for exclusion of these areas from excavation.

- In section 4.1.3 of the Plan, it was stated that the anticipated maximum depth of excavation for Area II would be approximately 7 feet. However, debris was noted at 11 feet below ground surface in boring SB-127, which is within the proposed excavation area. No justification was given for the exclusion of this refuse from the excavation.
- In section 5.3 of the Plan it was stated that "Up to 2,000 cubic yards (yd³) of soil and rubbish may be excavated from the proposed areas." Stopping excavation at a certain volume rather than at the limits of refuse and contamination as found through the investigation and as found during the excavation will not satisfy clean closure requirements.

Please respond to these comments through the submittal of a revised remedial action plan. If you have any questions or wish to discuss this matter, please contact me at (707) 570-3767.

Sincerely,



Craig Hunt
Water Resource Control Engineer

CSH:clh/GlassBeach0206

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Moira McEnespy, California State Coastal Conservancy, 1330 Broadway, 11th Floor, Oakland, CA 94612-2530
Roger Sternberg, Mendocino Land Trust, P.O. Box 1094, Mendocino, CA 95460
Lono Tyson, California Integrated Waste Management Board, 1001 "I" Street, P.O. Box 4025, Sacramento, CA 95812
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Pat Rogers, California Department of Parks and Recreation, Office of Acquisition and Planning, 1 Capitol Mall, Suite 500, Sacramento, CA 95814-3245

California Environmental Protection Agency

Reference: 099215

REMEDIAL ACTION PLAN

**GLASS BEACH PROPERTY
FORT BRAGG, CALIFORNIA
RWQCB CASE NO. 1NMC447**

Prepared for:

**WILLIAM J. BLINN TRUST
1543 LEWISTON DRIVE
SUNNYVALE, CALIFORNIA**

Prepared by:



CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash
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707-441-8855

May 2002

QA/QC: 

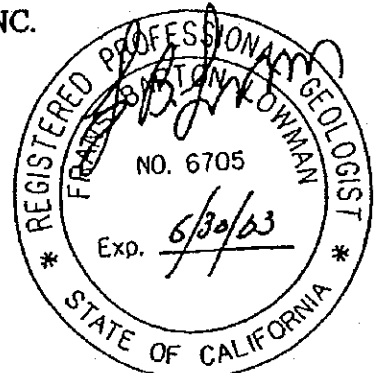


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EXECUTIVE SUMMARY

The William J. Blinn Trust requested SHN Consulting Engineers & Geologists, Inc. (SHN) to prepare this Remedial Action Plan (RAP) for the Glass Beach site, located in Fort Bragg, California.

The goal of the remedial action is to adequately mitigate the impact of the buried refuse so that the risk to the environment and the general public is minimized.

Three remedial alternatives were considered, based on site conditions and previous investigations. The alternatives reviewed were:

1. Excavation of source areas with off-site soil disposal.
2. Limited Excavation and capping of existing refuse areas with groundwater monitoring.
3. No action.

The alternatives were developed using proven technologies, engineering judgment, and professional experience. Although the owner desired the limited excavation and capping alternative recommended by SHN, as a result of discussions with other parties involved, the option of excavation of source areas with off-site disposal was chosen as the recommended alternative. This RAP outlines the procedures to implement this option.

1.0 INTRODUCTION

The William J. Blinn Trust requested SHN Consulting Engineers & Geologists, Inc. (SHN) to prepare this Remedial Action Plan (RAP) for the property known as Glass Beach in Fort Bragg, California (site, Figures 1 and 2).

Since 2000, the California Regional Water Quality Control Board, North Coast Region (RWQCB) has provided oversight on investigation at the site.

1.1 Purpose

The purpose of this RAP is to provide guidelines for the remediation of the site.

1.2 Remedial Action Goals

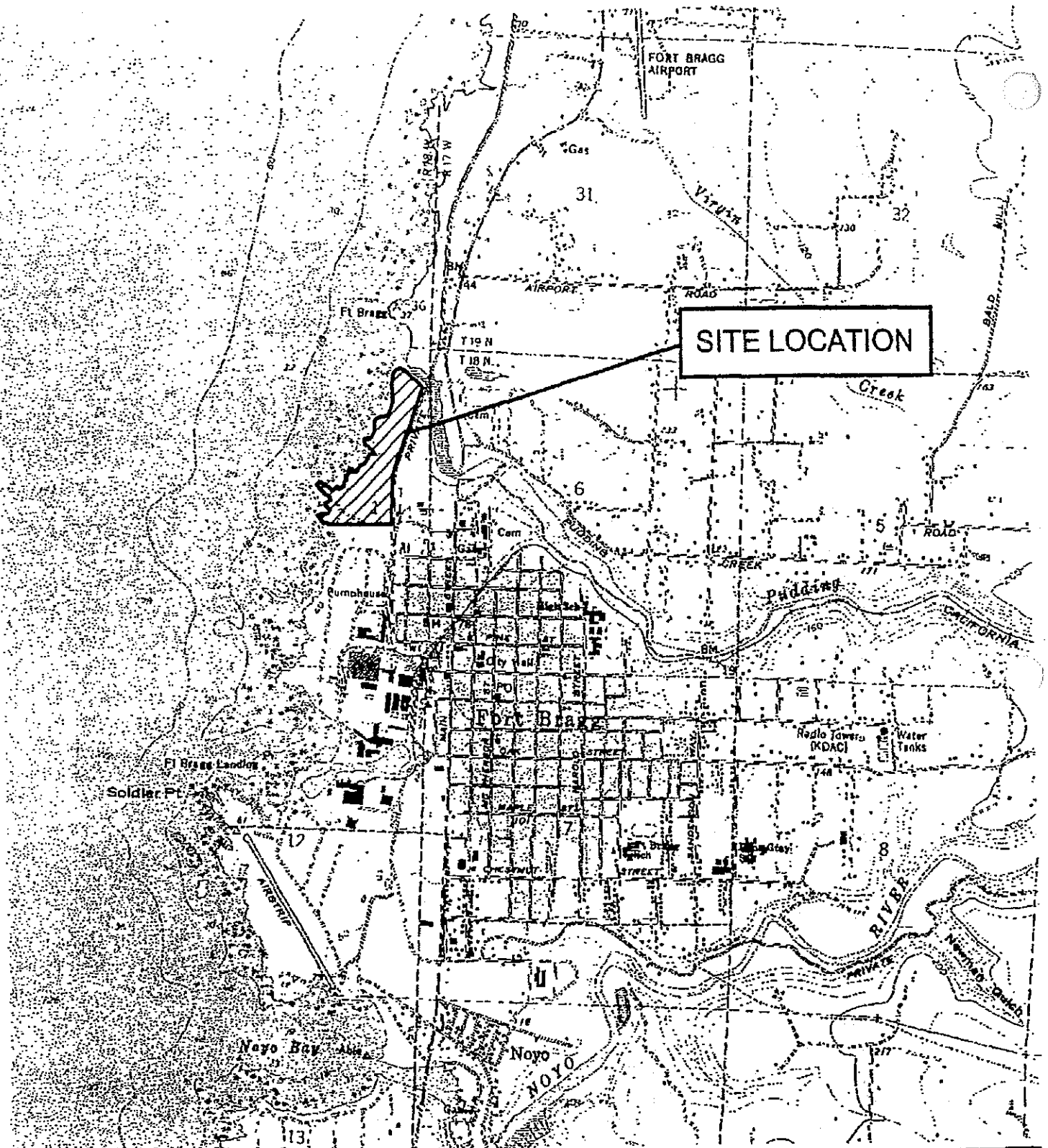
A meeting was held on February 11, 2002, (see meeting notes, Appendix "A") in Fort Bragg with all interested parties or their representatives to discuss remediation options presented in a Corrective Action Plan (CAP) prepared by SHN (SHN, December 2001). The goal of the remedial action was to adequately mitigate the impact of the buried refuse so that the risk to the environment and the general public is minimized.

Three remedial alternatives were considered, based on site conditions and previous investigations. The alternatives reviewed were:

1. Excavation of source areas with off-site soil disposal and groundwater monitoring.
2. Limited Excavation and capping of existing refuse areas with groundwater monitoring.
3. No action.

The alternatives were developed using proven technologies, engineering judgment, and professional experience. In the CAP, SHN recommended limited excavation of highly impacted source areas, with the capping of existing refuse areas and groundwater monitoring. However, several groups, including the California Department of Parks and Recreation (CDPR) had concerns with this option, including long-term management of a site with buried refuse along a high-energy coastal zone. The CDPR, Mendocino County Department of Environmental Health (MCDEH), and the California Regional Water Quality Control Board, North Coast Region (RWQCB), all indicated a preference for the excavation of source areas with offsite disposal (clean closure). Representatives from the California Integrated Waste Management Board (CIWMB) were present at the meeting to answer any questions regarding clean closure and their possible involvement in remediation of the site. They indicated that CIWMB involvement was a possibility, however, additional information regarding site history was needed.

This RAP presents guidelines for the remediation of the site through excavation of source areas with off-site refuse/soil disposal.



SOURCE: FORT BRAGG
USGS 7.5 MINUTE
QUADRANGLE

1000 0 1000 2000 Feet



QUADRANGLE
LOCATION

GLASS BEACH/BLINN PROPERTY
FORT BRAGG, CALIFORNIA

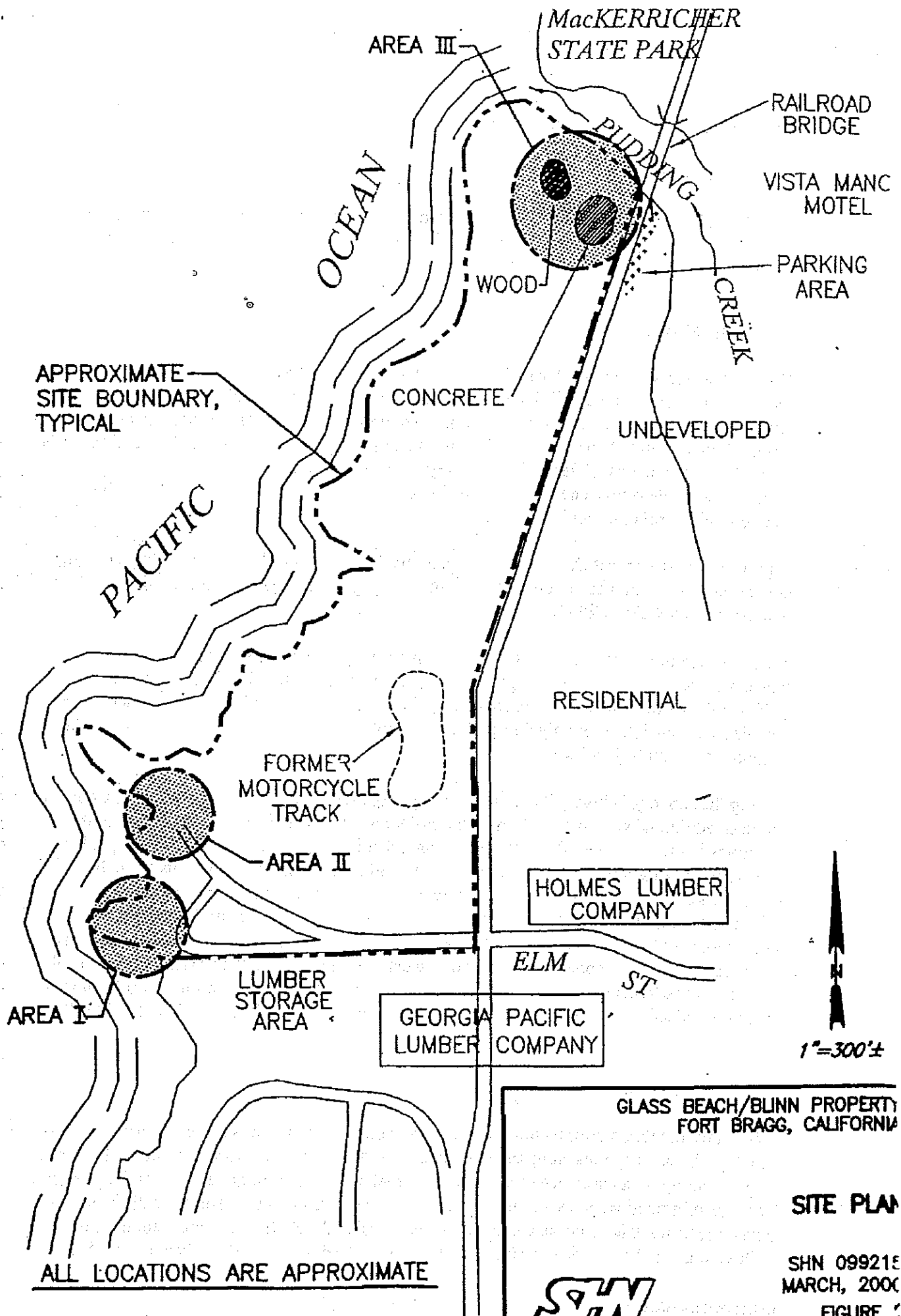
SITE LOCATION MAP

SHN 09921
DECEMBER, 200

SN

FIGURE 1

glassbeach-site



2.0 SITE CHARACTERIZATION

2.1 Site Location

The site is an approximate 38-acre parcel commonly referred to as Glass Beach and is located to the west of Highway 1 between the Georgia Pacific Lumber Company and Pudding Creek in Fort Bragg, Mendocino County, California.

2.2 Site History

The site has had several uses throughout its history. The southern portion of the property was used as a dumpsite and landfill from 1950 through 1967. Waste was discharged over the bluffs into the ocean. Some waste was placed in pits where it was burned and buried. A motorcycle racetrack was operated on a portion of the property sometime between the 1950's and the 1980's (Danatt and Associates, 1998). More recently, a portion of the northern end of the property was used as a concrete rubble and wood debris dumping area. There is currently a woodpile and a concrete rubble pile present in this area.

A preliminary site investigation was conducted by SHN in January/February 2000, including the collection of soil samples in three areas, from 24 borings, utilizing hand auger soil sampling equipment (SHN, April 2000).

As part of the investigation, each soil sample, including a surface soil sample collected from the beach area, was analyzed for total petroleum hydrocarbons as diesel (TPHD) and as motor oil (TPHMO), and the metals arsenic, cadmium, chromium, nickel, lead, and zinc. Selected soil samples were analyzed for polychlorinated biphenols (PCBs), pesticides, and semi-volatile organic compounds (SVOCs).

During the January/February 2000, site investigation, two areas of concern were identified which required additional site investigation. On April 9 and 10, 2001, SHN conducted an additional site investigation. As part of this investigation, 34 soil borings were drilled and sampled in the two areas utilizing direct push technology, and hand auger equipment. Results from this investigation confirmed the presence of elevated metals concentrations, primarily lead, in subsurface refuse/soils. Information from the two investigations was used to prepare the CAP. The February 11, 2002 meeting was held to discuss the site. As a result of the meeting, this RAP has been prepared, that presents the scope of work to be performed to excavate the impacted areas for offsite disposal. Once the remediation is complete, the plan for the site is for it to be sold to the Mendocino Land Trust, who will then transfer title of the property to the CDPR.

2.3 Site Geology

Subsurface lithologic information indicates that sandstone bedrock is present beneath both Area I and Area II. A gully runs along the north side of Area II that acts as a groundwater discharge zone, resulting in the presence of an unnamed creek that runs through this part of the property. The lack of groundwater encountered in the soil borings drilled at the site indicates that the sandstone bedrock is acting as a natural barrier, causing the shallow groundwater beneath the site to flow to the gully, where it discharges into the unnamed creek. The surface feature that

supports this conclusion is the vegetation that is present to the north and east of soil boring/well point SB-133, and the lack of spring discharge points along the bluffs of Areas I and II. The spring discharge point that had been identified during the April 2001 site visit was just to the north of Area II. Soil boring logs from the April 2001 additional site investigation are included in Appendix B.

3.0 NATURE AND EXTENT OF CONTAMINATION

The nature and extent of the soil and groundwater contamination at the site are summarized in this section. Results from environmental site investigations have identified three distinct areas where residual refuse material is present. There are two sub-areas in Area I, and one sub-area in Area II. These areas are presented in Figures 3 and 4, and are the target areas for this RAP. The horizontal and vertical extent of the existing refuse has been defined. The vertical extent has been defined by the presence of the sandstone bedrock that underlies the site. In both areas, the horizontal extent has been defined by soil borings and by the limits of the exposed rubbish that is present along the bluffs.

3.1 Soils

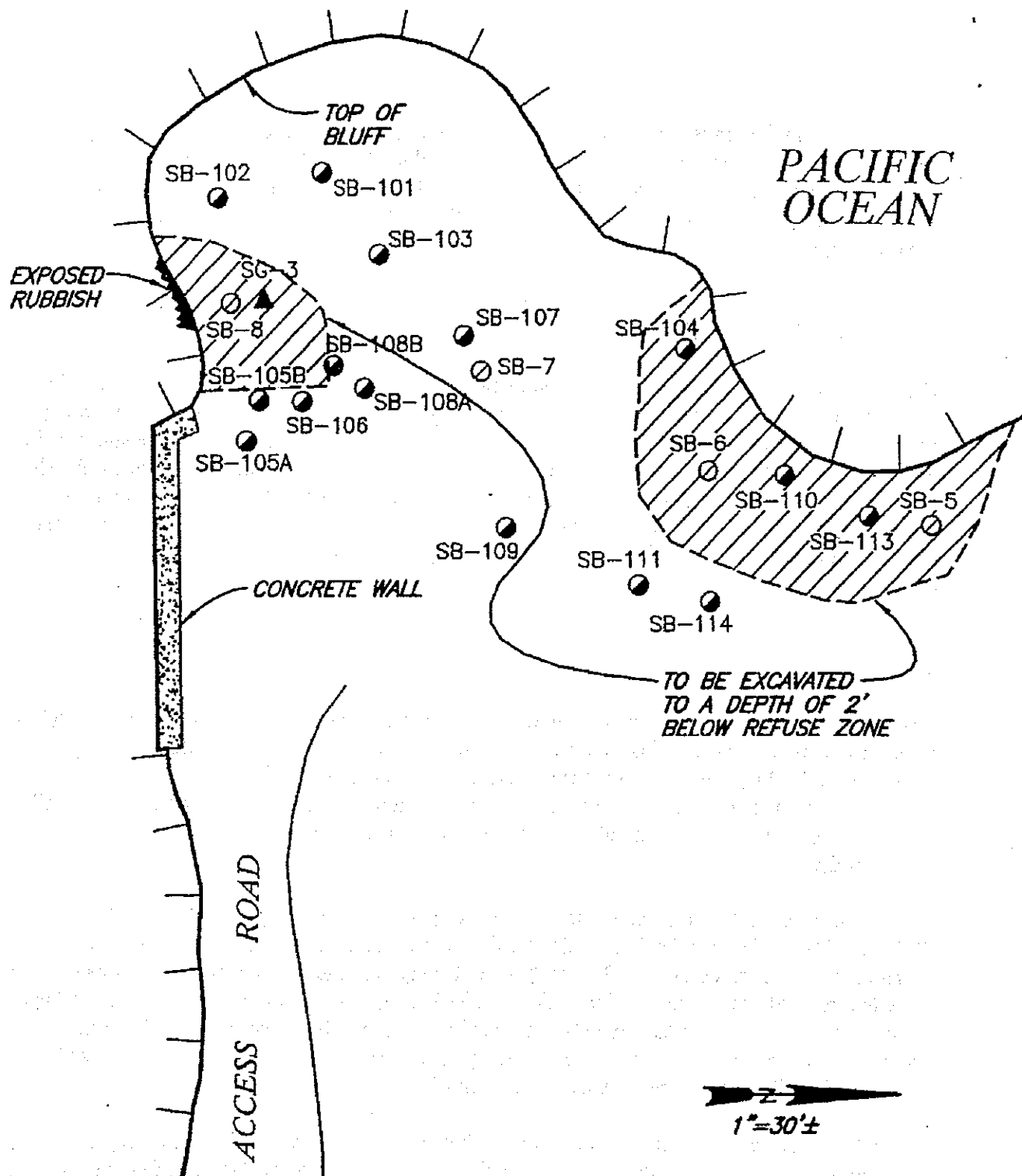
The analytical results of soil samples collected from soil borings in Areas I and II have identified three sub-areas where past refuse disposal activities have resulted in metals contamination, primarily lead. Only one soil sample analyzed for total lead, from boring SB-110, contained a total lead concentration that would classify it as a hazardous waste. Lead concentrations in soil found during the two site investigations in Areas I and II are shown in Figures 5 and 6, respectively.

Six soil samples, collected from all three sub-areas (SB-108B, SB-110, SB-113, SB-125, SB-127, and SB-129) had results that would classify the lead contaminated soil as hazardous waste using the waste extraction test (WET) method and comparing the leachate concentrations to the soluble threshold limit concentration (STLC). The WET method utilizes an acid as the leaching agent. The same soil samples were also analyzed for lead utilizing a modified WET method, where de-ionized water was used as the leaching agent, resulting in lead concentrations well below the STLC limit of 5 milligrams per liter (mg/L) set under Title 22.

Current subsurface conditions in each sub-area, including thickness of refuse and soil pH conditions, indicate that any leachate generated would be more representative of de-ionized water (precipitation infiltration) than of an acid leachate as may be found in large landfills with refuse layers hundreds of feet thick.





Elevated copper and nickel concentrations were found in Area I, and elevated nickel concentrations were found in Area II. In both Area I and Area II, the elevated copper and nickel concentration were found in the same soil samples that contained elevated lead concentrations.

Petroleum hydrocarbon concentrations found in Area I were at concentrations that appear to be of minimal threat. TPHG and BTEX were not found, and TPHD and TPHMO concentrations are low. The highest petroleum hydrocarbon concentrations were found in the same soil sample that contained an elevated lead concentration.



EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

-  **ESTIMATED LIMITS OF EXCAVATION**
-  **SB-101 SOIL BORING/WELL POINT LOCATION AND DESIGNATION APRIL 2001/SITE INVESTIGATION**
-  **SB-5 SOIL BORING LOCATION AND DESIGNATION (JANUARY/FEBRUARY 2000 SITE INVESTIGATION)**
-  **SG-3 SOIL GAS SAMPLING LOCATION AND DESIGNATION (JANUARY/FEBRUARY 2000 SITE INVESTIGATION)**

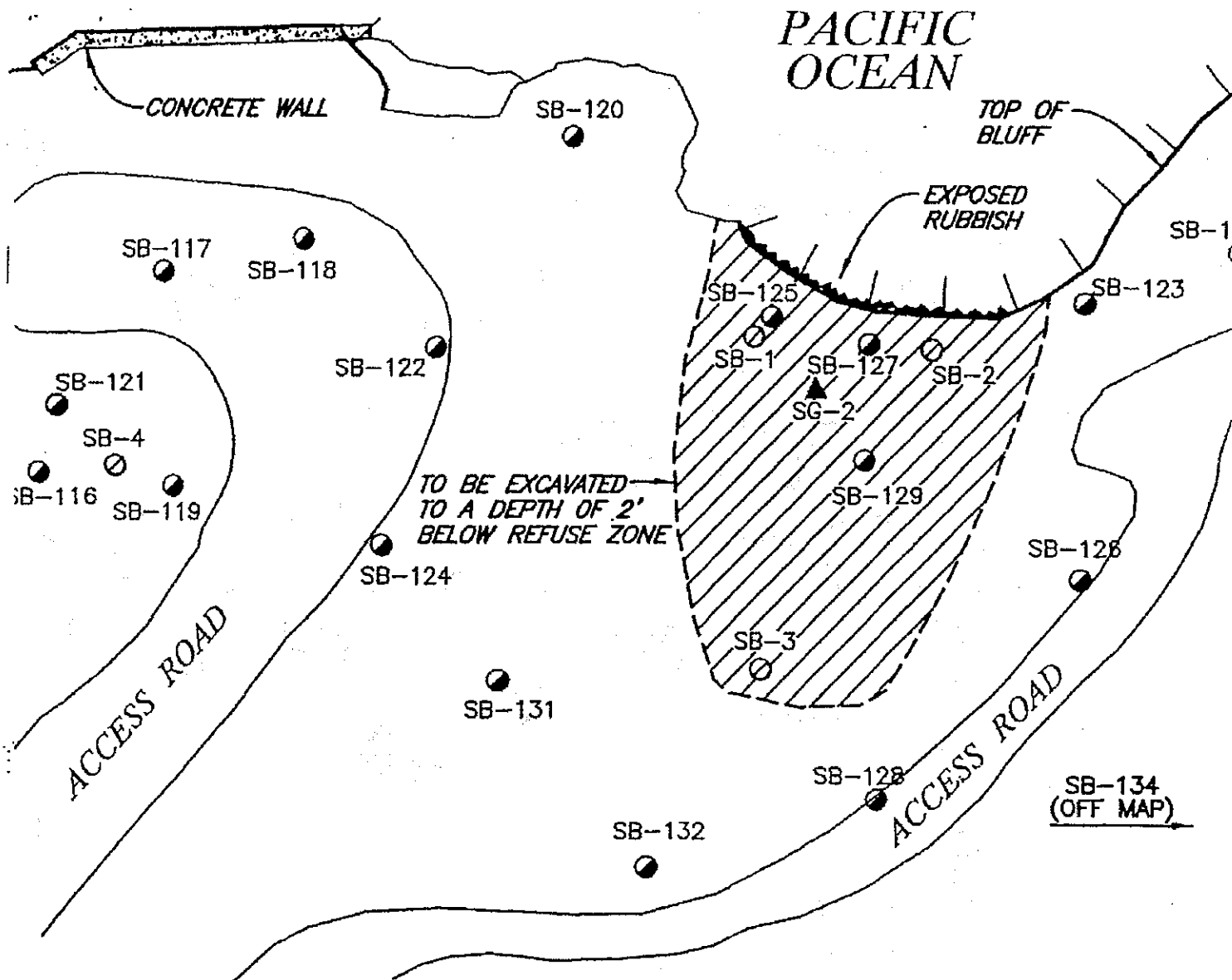
1/1999/099215/DWG/99215-EXCAVATION

GLASS BEACH/BLINN PROPERTY
FORT BRAGG, CALIFORNIA

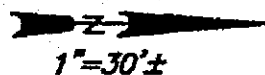
**EXCAVATION OF SOURCE
AREAS, AREA**

SW

SHN 099215
MAY, 2002
FIGURE 3



ALL LOCATIONS ARE APPROXIMATE



EXPLANATION



ESTIMATED LIMITS OF EXCAVATION

SB-129 SOIL BORING/WELL POINT LOCATION AND DESIGNATION APRIL 2001/SITE INVESTIGATION

SB-1 SOIL BORING LOCATION AND DESIGNATION (JANUARY/FEBRUARY 2000 SITE INVESTIGATION)

SG-2 SOIL GAS SAMPLING LOCATION AND DESIGNATION (JANUARY/FEBRUARY 2000 SITE INVESTIGATION)

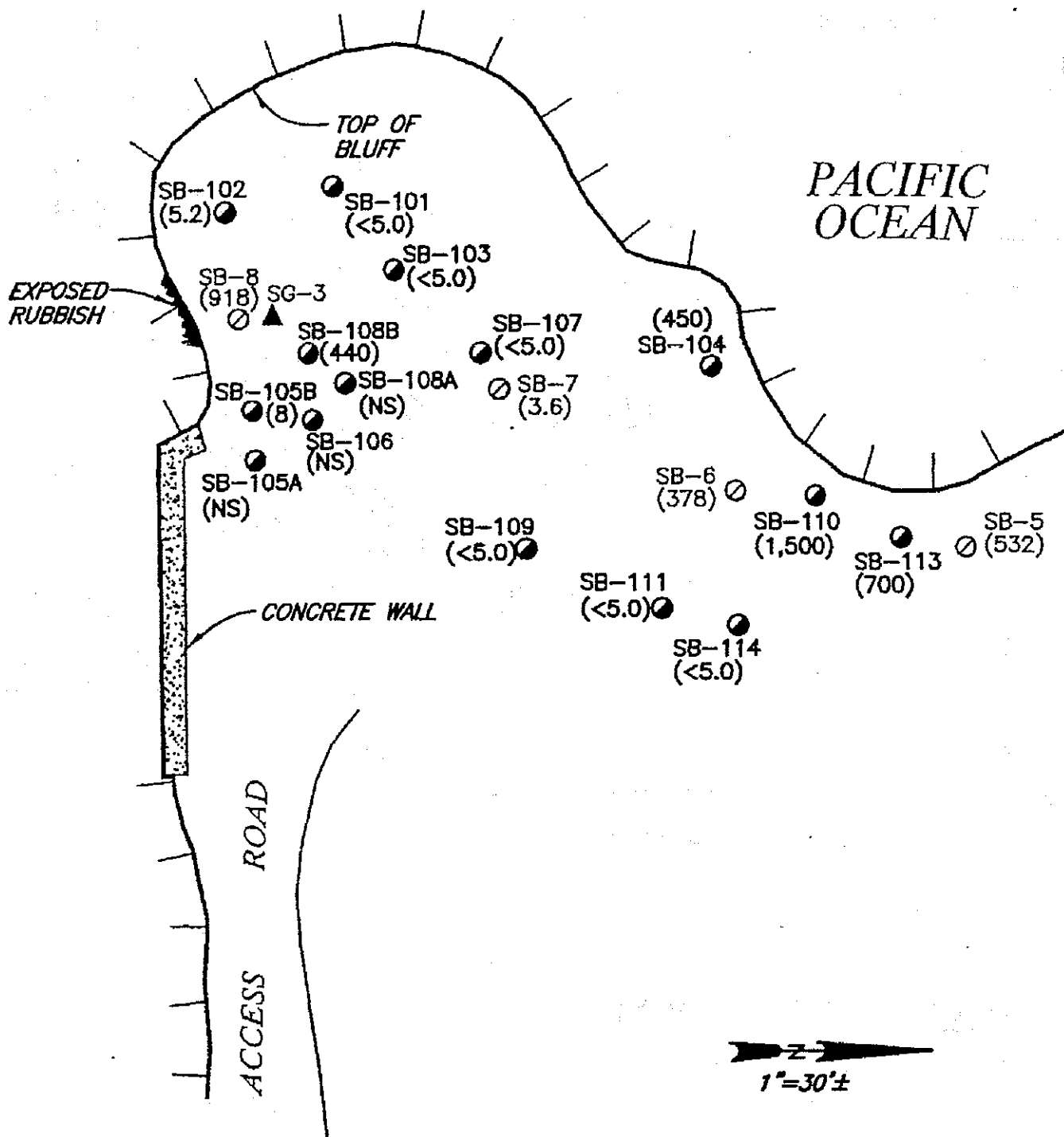
1/1999/099215/DWG/99215-EXCAVATION

GLASS BEACH/BLINN PROPERTY
FORT BRAGG, CALIFORNIA

**EXCAVATION OF SOURCE
AREAS, AREA 1**



SHN 099215
MAY, 2002
FIGURE 4



EXPLANATION

- (NS) NOT SAMPLED
- (5.2) LEAD CONCENTRATIONS IN SOIL (IN mg/Kg)
- SB-101 SOIL BORING/WELL POINT LOCATION AND DESIGNATION
- SB-5 SOIL BORING LOCATION AND DESIGNATION (JANUARY/FEBRUARY 2000 SITE INVESTIGATION)
- SG-3 SOIL GAS SAMPLING LOCATION AND DESIGNATION (JANUARY/FEBRUARY 2000 SITE INVESTIGATION)

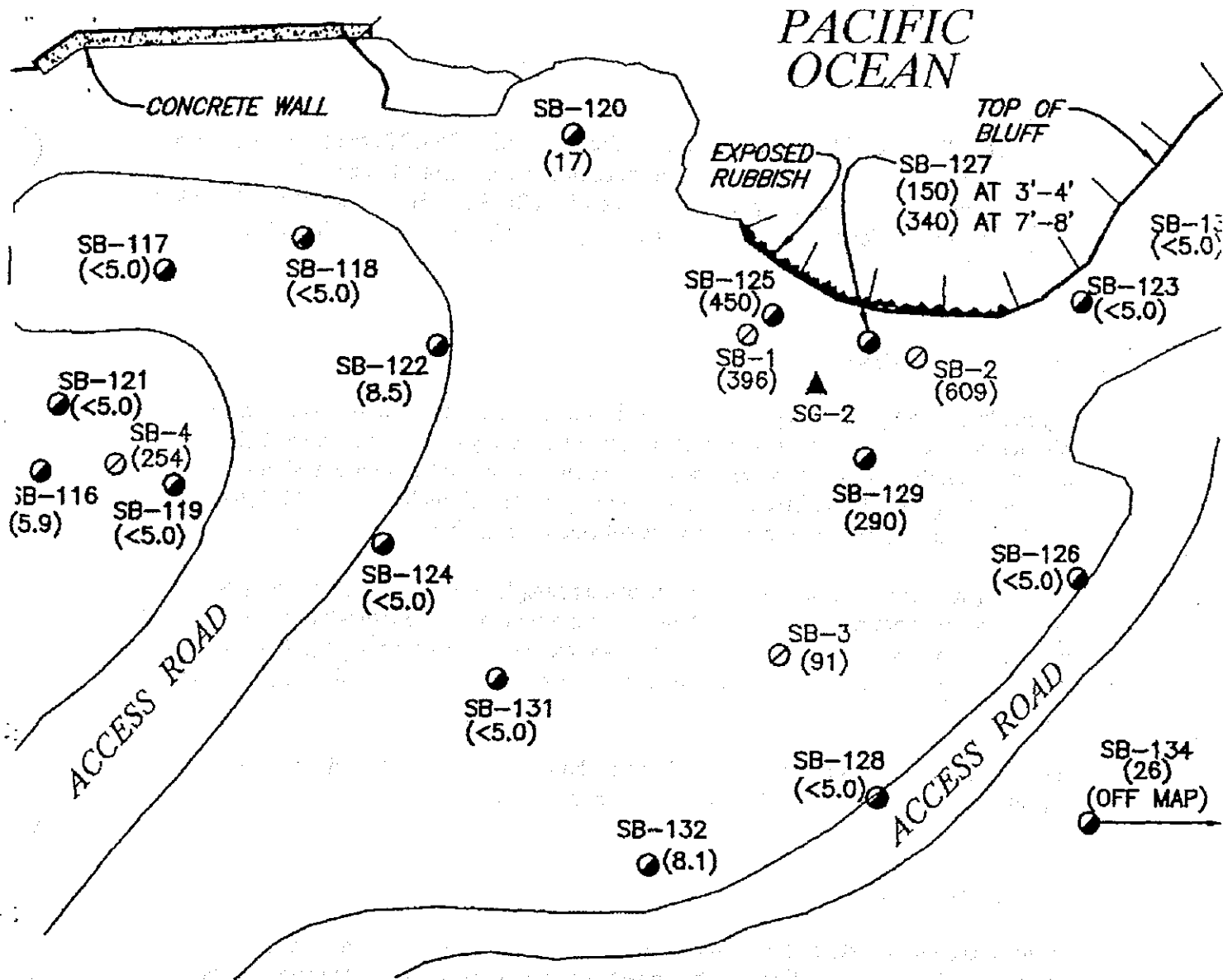
ALL LOCATIONS ARE APPROXIMATE

GLASS BEACH/BLINN PROPERTY
FORT BRAGG, CALIFORNIA

ARE/
LEAD CONCENTRATIONS IN SOIL

SHN 09921:
MAY, 200
FIGURE 1

SN



ALL LOCATIONS ARE APPROXIMATE



1"=30'±

EXPLANATION

- (5.2) LEAD CONCENTRATIONS IN SOIL (IN mg/Kg)
- SB-129 SOIL BORING/WELL POINT LOCATION AND DESIGNATION
- SB-1 SOIL BORING LOCATION AND DESIGNATION (JANUARY/FEBRUARY 2000 SITE INVESTIGATION)
- SG-2 SOIL GAS SAMPLING LOCATION AND DESIGNATION (JANUARY/FEBRUARY 2000 SITE INVESTIGATION)

GLASS BEACH/BLINN PROPERTY
FORT BRAGG, CALIFORNIA

**AREA 1
LEAD CONCENTRATIONS IN SOIL**

SHN 099211
MAY, 200
FIGURE 1

SHN

In Area II, TPHD and TPHMO concentrations found in boring SB-127 are at concentrations that could impact groundwater. However, these concentrations are limited in extent, as shown by petroleum hydrocarbon concentrations found in borings SB-123, SB-125, and SB-129. TPHG and BTEX were not found in this area. A summary of soil historical data is included in Appendix C.

3.2 Water Analysis

A groundwater sample was collected from well point SB-133, and a surface water sample was collected from the unidentified creek that crossed the property just north of Area II. Due to subsurface conditions, groundwater was only encountered in one temporary well point, and a spring discharge point identified for sampling during a site visit on March 13, 2001, had gone dry. Therefore only two water samples were collected during this site investigation.

Lead and zinc were not detected in the groundwater sample collected from well point SB-133. The petroleum hydrocarbon constituent toluene was found in the groundwater sample collected from well point SB-133 at a concentration of 0.43 micrograms per liter (ug/L). No other petroleum hydrocarbons were detected in the groundwater sample collected from well point SB-133.

None of the constituents tested for were found in the water sample collected from the unidentified creek that crossed the property just north of Area II.

3.3 Sensitive Receptors

The unnamed creek that flows into the Pacific Ocean, and the Pacific Ocean are the only potential sensitive receptors that may be impacted by the refuse buried at the site. Analytical results of the water sample collected from the unnamed creek indicate that the creek has not been impacted. The lack of groundwater in the immediate refuse areas would indicate that the impact to the Pacific Ocean by site conditions would be minimal. There is a potential risk to the general public as a result of exposure to exposed debris and rubbish, including a risk of personal injury and exposure to hazardous levels of lead.

4.0 REMEDIAL ALTERNATIVE

In the CAP, SHN identified the option of limited excavation and capping of existing refuse areas with groundwater monitoring as the preferred corrective action option. This was also the property owner's preferred option. However, due to concerns raised over the long-term maintenance of the site, excavation of source areas with off-site disposal has been selected. This section presents the remedial alternative chosen for this site along with a discussion its implementation.

4.1 Excavation of Source Areas With Off-Site Soil Disposal

The source areas located in Areas I and II will be excavated to the extent practical (Figures 3 and 4, respectively). For the purposes of this RAP, each buried refuse area would be excavated to an approximate depth of two feet below the base of the refuse zone, or to the bedrock interface, for the entire horizontal extent of each refuse area. A limiting factor in the excavation process would be the presence of the bedrock material identified during the site investigations. Where applicable, soil-boring information will be used to classify refuse/soils for disposal purposes. Excavated materials may be transported to a Class I or Class II disposal facility based on elevated metals (primarily lead) concentrations found in refuse/soil samples collected from borings in each area.

Confirmation sampling and field monitoring, including close visual inspection of the excavated areas for the presence of refuse material will be used to determine the depth and extent of each excavation. An initial estimate of the refuse/soil to be excavated near the source areas determined during the subsurface investigation work is 2,000 cubic yards. Following excavation activities, each area would be backfilled with clean, imported material to grade level.

4.1.1 Area I, Sub-Area 1

It appears that rubbish in this area was dumped into a very steep and narrow gully along the bluff that overlooks the Pacific Ocean. The rubbish has been covered with a thin layer of topsoil, and a depression is present at the top of the overburden material. Access to this area is very limited by the terrain that surrounds it. Elevated lead concentrations were found in the soil sample collected from boring SB-8.

Excavation would begin in the location of soil boring SB-8. Approximately 300 cubic yards of rubbish/soil would be excavated. This area is along the edge of a steep bluff where backfilling may not be possible once the excavation work is complete. Therefore, there are no plans to backfill this excavation area. It is anticipated that excavation will be conducted to depths ranging up to approximately 10 feet below ground surface (BGS). The estimated excavation limits for Area I, sub-area 1 is shown in Figure 3.

4.1.2 Area I, Sub-Area 2

The rubbish in this area is exposed at the surface and is cemented together. It is sloping slightly towards the west. Bedrock material that is present throughout this area acts as the defining limits to the north and south.

Excavation would begin in the location of soil borings SB-110 and SB-113. A lead concentration of 1,500 mg/Kg was found in the soil/rubbish sample collected from boring SB-110, and concentrations of lead greater than the STLC limit were found in both SB-110 and SB-113. Approximately 400 cubic yards of soil/rubbish would be excavated. The excavation would then be backfilled with clean imported material. It is anticipated that excavation will be conducted to depths ranging up to approximately 4 feet BGS. The estimated excavation limits for Area I, sub-area 2 is shown in Figure 3.

4.1.3 Area II

The rubbish in this area is covered by an approximate one to two-foot thick layer of soil. The rubbish is exposed along the west bluff that overlooks the Pacific Ocean. This exposed bank is approximately three feet high. The area where the rubbish is buried is depressed, which may have been a result of the compression of the rubbish over time.

Excavation would begin in the location of soil boring SB-127. Approximately 1,300 cubic yards of soil/rubbish would be excavated. The excavation would then be backfilled with clean imported material. It is anticipated that excavation will be conducted to depths ranging up to approximately 7 feet BGS. The proposed excavation area for Area II is shown in Figure 4.

5.0 SCOPE OF WORK

The scope of work is presented below and is designed to provide the information needed to meet the objective of this investigation.

- Project implementation, including subcontractor coordination.
- Agency coordination.
- Site control during the excavation process.
- The excavation of old rubbish and debris.
- Temporary storage, transport and disposal of excavated material.
- Laboratory analysis of confirmation soil samples.
- Preparation of a report of findings.

5.1 Project Implementation

SHN is providing this RAP, and will coordinate permitting and the field program with all involved parties, including the CIWMB, City of Fort Bragg and the California Coastal Conservancy. This excavation program will be conducted within the coastal zone, and may require a coastal development permit or a waiver from the California Coastal Commission. Any permitting required by the California Coastal Commission will be handled through the City of Fort Bragg. Due to their involvement in the project, the CIWMB may oversee the excavation and subsequent clean closure of the site.

5.2 Field Program

It is proposed that approximately 2,000 cubic yards of rubbish/soil be removed from the site through excavation. Due to the shallow depths at which the rubbish is present, excavation is an efficient method for the removal of the material. Soil samples will be collected from the excavation sidewalls and floor to assess post excavation subsurface conditions. Prior to the implementation of the excavation work, staging and temporary soil/refuse stockpiling areas will be identified. These areas along with the excavation areas will be fenced and secured.

A site safety plan will be prepared by the contractor conducting the excavation work that will address site safety issues related to the excavation program.

5.3 Soil Excavation

Based on the information collected to date outlining existing site conditions, SHN recommends that soil excavation be conducted at the site to remove source area contaminated soil. Excavation work will be started in Area II since this is the largest of the areas to be excavated. Once excavation work is complete in Area II, excavation will be conducted in Area I.

Up to 2,000 cubic yards (yd³) of soil and rubbish may be excavated from the proposed areas. Actual excavated volumes will be assessed in the field based on conditions encountered during excavation. The area will be excavated using an excavator, while excavated material is visually inspected and monitored using an organic vapor analyzer (OVA). Field data collected during the excavation process will be used to assess when excavation is complete and can be stopped. Information used in the decision making process will include the presence of bedrock material, the absence of refuse material and measured contaminant concentrations using the OVA. Upon completion of over-excavation, confirmation soil samples will be collected from the floor and sidewalls of the excavated area for laboratory analysis. One soil sidewall sample will be collected for every 20 linear feet of sidewall. One soil sample will be collected for each 400 square feet of base area for laboratory analysis. All soil samples will be collected directly from the sidewall and floor, if accessible, or from the bucket of the excavation equipment used during the excavation process. Each sample will be labeled, stored in an iced cooler, and transported to the laboratory under proper chain-of-custody documentation. Each soil sample will be analyzed for lead, TPHD, and TPHMO.

An expedited analysis of the samples submitted to the analytical laboratory will be requested to quickly assess the effectiveness of the excavation program. Backfilling of any areas will be delayed until the analytical results have been received, confirming that the excavation work is complete. Any areas where analytical results indicate the presence of elevated contaminant levels will be excavated further and re-sampled.

Where appropriate, the excavation will be backfilled with clean backfill material. Upon completion of the excavation work, the extent of each excavated area will be staked, and surveyed for location. The RWQCB will be provided with a minimum 5-day advance notice prior to the conduct of any excavation activities.

5.4 Excavation Cleanup Standards

Each excavation area will be remediated to levels that would not be considered a threat to the public or environment if left in place, with the following maximum concentrations to be used as guidelines:

- A lead concentration of 50 milligrams per kilogram (mg/kg).
- A TPHD and TPHMO concentration of 100 mg/kg.

5.5 Soil Disposal

Refuse/Soil generated during the excavation program will be temporarily stored on site in a pre-designated area that will be secured with temporary fencing. The refuse/soil will be sampled for laboratory analysis. One soil sample will be collected for each 100 cubic yards of excavated material. All samples will be collected directly from the stockpiled material. Each sample will be labeled, stored in an iced cooler, and transported to the laboratory under proper chain-of-custody documentation. Each soil sample will be analyzed for lead, TPHD, and TPHMO.

Upon receipt of the analytical results, the soil will be loaded into trucks and transported to a facility licensed to accept such materials. The excavated material will not be stored on site for more than 30 days.

5.6 Equipment Decontamination Procedures

All small equipment that requires on-site cleaning will be cleaned using the following triple wash system. The equipment will first be washed in a water solution containing Liquinox® cleaner, followed by a water rinse, then by a distilled water rinse. Soil samples will be collected in pre-cleaned containers supplied by the analytical laboratory.

6.0 REPORT PREPARATION AND FIELD PROGRAM IMPLEMENTATION

A report of findings will be prepared for submittal to the RWQCB, discussing the results of all field activities. Disposal receipts of the excavated material will be provided in the report of findings. The field program will be implemented upon receipt of approval to proceed. A final report will be prepared for submittal to the RWQCB approximately six weeks after receipt of laboratory results.

7.0 REFERENCES

Danatt and Associates. (December 17, 1998). Modified Phase I Environmental Site Assessment for Glass Beach Property in Fort Bragg, Mendocino, California. NR: D&A.

SHN Consulting Engineers & Geologists, Inc. (April 2000). Site Assessment Report, Glass Beach Property, Fort Bragg, California. Eureka: SHN.

---. (April 2001). Additional Site Assessment Report of Findings, Glass Beach Property, Fort Bragg, California. Eureka: SHN.

---. (December 2001) Corrective Action Plan, Glass Beach Property, Fort Bragg, California. Eureka: SHN.

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RECEIVED

JUL 2 2002

CITY OF FORT BRAGG
PLANNING DEPT.

Preliminary Botanical Field Survey for Glass Beach

Botanical Field Survey Guidelines followed: (A combination of the Dept of Fish and Game Guidelines as listed in the Jan. 2000, CDF NDDB special plant list and the CNPS Guidelines adopted 6/2201))

July 25, 2002

1. Project Description including a map of the project and study area

The project is to excavate soil in order to remove toxic levels of lead, nickel and copper. See the *Remedial Action Plan, Glass Beach Property* prepared by SHN, Consulting Engineers & Geologists, May, 2002.

2. A written description of biological setting (Plant Community and a vegetation map)

The Glass Beach parcel contains North Coast Bluff Scrub, a willow dominated wetland and riparian area and a coastal prairie. Most of the project takes place within a very disturbed part of the north coastal bluff scrub. Human impact is considerable at the project site, from past dumping of refuse.

The North Coast Bluff Scrub is a plant community that receives high winds, salt spray, and long hours of exposure to the sun, and though the soil is still sandy, there are more nutrients available because the soil is more developed, a result of a longer history of plant habitation. The major difference is that the bluff scrub frequently has a high water table because the layer of soil is atop a base of greywacke sandstone, a nonporous sedimentary rock. Plants in this community are low-growing, often prostrate, 5 - 50 cm high. They form either scattered or continuous mats of dwarf shrubs, herbaceous perennials and annuals. This community intergrades into coastal prairie. Although these plants are less stressed for water than plants of the strand and dunes, the remaining conditions of their environment still require water retention strategies: low growth, silver foliage, small hairy or sticky leaves.

The wetland is mainly dominated by willow, *Salix lasiolepis*. Sedge, *Carex obnupta*; rush, *Juncus breweri*; cinquefoil, *Potentilla anserina* occur in the wetter sites.

The following plants that occur there are listed according to their wetland classification rank that can be found at:

<http://enterprise.nwi.fws.gov/ecology/list88/region0.txt>

Indicator Categories

Attachment 5.
Botanical Study

Obligate Wetland (OBL). Occur almost always (estimated probability >99%) under natural conditions in wetlands.

Facultative Wetland (FACW). Usually occur in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.

Facultative (FAC). Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).

Facultative Upland (FACU). Usually occur in non-wetlands (estimated probability 67%-99%), but occasionally found in wetlands (estimated probability 1%-33%).

Obligate Upland (UPL). Occur in wetlands in another region, but occur almost always (estimated probability >99%) under natural conditions in non-wetlands in the region specified.

The wetland indicator categories should not be equated to degrees of wetness. Many Obligate Wetland species occur in permanently or semipermanently flooded wetlands, but a number also occur and some are restricted to wetlands that are only temporarily or seasonally flooded.

The Facultative Upland species include a diverse collection of plants that range from weedy species adapted to a number of environmentally stressful or disturbed sites (including wetlands) to species in which a portion of the gene pool (an ecotype) always occur in wetlands. Both the weedy and ecotype representatives of the facultative upland category occur in a variety of wetland habitats, ranging from the driest wetlands to semipermanently flooded wetlands.

The actual frequency of occurrence of a specific species in wetlands may be anywhere within the frequency range of the indicator category. For example, some species assigned to the Facultative Upland indicator category may actually have a frequency toward the lower end of the category whereas other species may actually have a frequency toward the upper end of the category.

Wetland species found at this site include:

"*Anthoxanthum odoratum*", "L.", "GRASS, SWEET VERNAL", "UPL, FACU", "FACU", "PIG"
"*Carex obnupta*", "L.H. BAILEY", "SEDGE, SLOUGH", "OBL", "OBL", "PNGL"
"*Holcus lanatus*", "L.", "GRASS, COMMON VELVET", "FACU, FACW", "FAC", "PNG"
"*Juncus lesueurii*", "BOLAND.", "RUSH, SALT", "FACW, FACW", "FACW", "PNGL"
now *Juncus breweri*
"*Potentilla anserina*", "L.", "SILVERWEED", "FACW, OBL", "OBL", "PNF"
"*Salix lasiolepis*", "BENTH.", "WILLOW, ARROYO", "FACW", "FACW", "NS"
"*Rubus vitifolius*", "CHAM. & SCHLECHT.", "BLACKBERRY, CALIFORNIA", "FACW", "FACW*", "NS"
now *Rubus ursinus*
"*Stachys ajugoides*", "BENTH.", "HEDGENETTLE, BUGLE", "OBL", "OBL", "PNF"
AIT., "GRASS, GOLDEN", "FACW+, OBL", "OBL", "PNF"

Plants that are native to this community that are on the Glass Beach clean up site include: *Armeria maritima*, (Sea Pink); *Erigeron glaucus*, (Seaside Daisy); *Eriogonum latifolium*, (Dune Buckwheat); *Eschscholzia californica*, (California Poppy); *Fragaria chiloensis*, (Beach Strawberry); *Grindelia stricta*, (Gum-plant); and *Heterotheca sessilifolia*, (Golden-aster)

The area is dominated by non native plants and many invasive exotics including: *Anthoxanthum odoratum*, (Sweet Vernal Grass); *Briza maxima*, (Quaking Grass); *Carpobrotus chilensis*, (Ice Plant); *Carpobrotus edulis*, (Ice Plant); *Holcus lanatus*, (Velvet Grass); *Raphanus sativus*, (Wild Radish) and *Hypochoeris radicata* (coast dandelion)

3. Detailed description of survey methodology

The project area was surveyed on three separate dates, walking over the entire site.

4. Dates of field surveys:

March 15, 2001

July 5, 2002

July 22, 2002

Twice a year from 1976 to the present

5. Total person hours spent on field survey

At this project site for this project only, 3 hours

6. Results of survey (including detailed maps)

No rare or endangered species occur on the project site. It is possible that the project may impact a small area of the Willow Wetland.

7. Assessment of potential impacts

Large areas of exposed soil will result from the project clean up. It is possible that a small part of the Willow wetland may be impacted.

8. Discussion of the importance of rare, threatened or endangered plant populations with consideration of nearby populations and total species distribution.

There are 7 sensitive species on the entire parcel. None were found within the project site,

The 7 sensitive species that occur north of the creek (not within the project site are)

Agrostis blasdalei:

Blennosperma nanum var. *robustum*

Castilleja mendocinensis

Erysimum menziesii var. *menziesii* x *concinnum*

Hesperis matronalis var. *brevifolia*

Lasthenia macrantha ssp. *macrantha*

Phacelia insularis var. *continentis*

The possible species that could occur on the site are listed below: None of these were found on the project site.

Possible Rare North Coast Bluff Scrub/ species

Plant/Family/Notes	CNPS	R-E-D	State/Fed.	Habitat	List Code
<i>Agrostis blasdalei</i>					
<i>Angelica lucida</i>		4	1-2-1	CoBlScr, CoScr, CoDns, coastal salt Marsh	
<i>Blennosperma nanum</i> var. <i>robustum</i>	1B	3-2-3	CR/C2	CoPr, CoScr	
<i>Calamagrostis bolanderi</i>	1B	2-2-3		CoScr, BogFns, Mesic Medws, FW	
<i>Calandrinia breweri</i>	4	1-2-2	CEQA?	Chprl, CoScr/disturbed sites, burns	
<i>Calystegia pupurata</i> ssp. <i>saxicola</i>	1B	2-2-3		CoScr, CoDns	
<i>Carex saliniformis</i>	1b	2-2-3		CoScr, CoPr, coastal salt Marsh	
<i>Castilleja affinis</i> ssp. <i>littoralis</i>	2	2-2-3		CoBlScr, CoScr, CoDns	
<i>Castilleja mendocinensis</i>	1B	2-2-3	/C2	CBScr, CCFrs, CoPr, CoScr	
<i>Clarkia amoena</i> ssp. <i>whitneyi</i>	1B	3-3-3		CoScr, CoBl Scr	

<i>Ceanothus gloriosus</i> var. <i>gloriosus</i>	4	1-1-3	CEQA? CBScr, CCFrs,
<i>Clarkia amoena</i> ssp. <i>whitneyi</i>	4	1-1-3	/C3c CBScr, CoScr
<i>Erigeron supplex</i>	1B	3-2-3	/C2 CBScr, CoPrr
<i>Gilia capitata</i> ssp. <i>chamissonis</i>	1b	2-3-3	CoScr, CoDns
<i>Gilia capitata</i> ssp. <i>pacifica</i>	2	2-2-2	CoBScr, CoPr,
<i>Fritillaria roderickii</i>	1B	3-2-3	CE/C3b CBScr, CoPrr, VFGrS
<i>Hemizonia congesta</i> ssp. <i>leucocephala</i>	3	??-3	CEQA? CoScr, VFGrS
* <i>Hesperis matronalis</i> var. <i>hrevifolia</i>	2	2-2-1	CEQA? CBScr, CoDns
<i>Horkelia marinensis</i>	1B	3-1-3	/C2 CoDns, CoPrr, CoScr
<i>Lasthenia macrantha</i> ssp. <i>bakeri</i>	1b	2-2-3	CoScr
<i>Lasthenia macrantha</i> ssp. <i>macrantha</i> 1b	2-2-3	CoScr, CoDns	, CoBScr
<i>Microseris paludosa</i>	1b	2-2-3	CCFrS, CoScr
<i>Lilium maritimum</i> 1B	2-3-3	/C1	BUFrS, CCFrS, CoPrr, CoScr, NCFrS
<i>Phacelia insularis</i> var. <i>continentis</i>	1B	3-2-3	/C2 CBScr, CoDns
<i>Senecio bolanderi</i>	2	CoScr, CoDns, NCFrS	
<i>Sidalcea malvaeflora</i> ssp. <i>patula</i>	1b	3-3-3-	BuFrS, CoPrr
<i>Sidalcea malvaeflora</i> ssp. <i>purpurea</i>	1B	2-2-3	

9. Recommended measures to avoid impacts

Since the project is removal of toxic wastes then there is no way to avoid impacting this already highly disturbed area. The area is so over run with aggressive exotic plants like ice plant that restoration of the site after the project should improve the quality of the site. It is recommended that the ice plant in the project site be removed along with the toxic material. Then after the project is completed; revegetation with native species that occur on the site is recommended.

Cuttings, division and transplantation of the following species that occur on the site is recommended. It is important not to revegetate with material that is not indigenous to this site.

<i>Angelica hendersonii</i>	Angelica
<i>Eriophyllum lanatum</i> var. <i>arachnoideum</i>	
<i>Erigeron glaucus</i>	Seaside Daisy
<i>Grindelia stricta</i> var. <i>platyphylla</i>	Gum Plant
<i>Heterotheca sessiliflora</i> ssp. <i>bolanderi</i>	Golden-aster
<i>Armeria maritima</i> ssp. <i>californica</i>	Sea Pink Thrift
<i>Eriogonum latifolium</i>	Coast Buckwheat
<i>Fragaria chiloensis</i>	Beach Strawberry
<i>Potentilla anserina</i> ssp. <i>pacifica</i>	Cinquefoil
<i>Iris douglasiana</i>	Douglas Iris
<i>Sisyrinchium bellum</i>	Blue-eyed Grass
<i>Sisyrinchium californicum</i>	Golden-eyed Grass
<i>Bromus carinatus</i> var. <i>maritimus</i>	California Brome
<i>Hordeum brachyantherum</i>	

Successful revegetation is best done November- February. This allows the natural rainfall to help establish the new plants.

10. List of species occurring on the project site

PRELIMINARY CHECKLIST FOR GLASS BEACH CLEAN UP SITE

Acacia melanoxylon
Achillea millefolium
Allium triquetrum
Angelica hendersonii
Anthoxanthum odoratum
Armeria maritima
Avena barbata
Baccharis pilularis
Baccharis douglasii
Brassica oleracea
Brassica nigra
Briza maxima
Bromus diandrus
Bromus carinatus
Bromus mollis
Chrysanthemum segetum
Carpobrotus chilensis
Carpobrotus edulis
Chamomilla suaveolens
Cupressus macrocarpa
Cytisus scoparius
Dactylis glomerata
Dudleya farinosa
Leymus mollis
Epilobium paniculatum
Erigeron glaucus
Erodium spp.
Erodium. cicutarium
Eriogonum latifolium
Eschscholzia californica
Festuca megalura
Fragaria chiloensis
Galium sp.
Gaultheria shallon
Geranium carolinianum
Geranium molle
Gnaphalium sp.
Grindelia stricta
Heterotheca sessiliflora ssp. *bolanderi*
Holcus lanatus
Hordeum sp.
Hypochoeris radicata
Iris douglasiana
Lavatera arboreus
Lessingia filaginifolia var. *californica*
Linum sp.

Blackwood Acacia
 Yarrow
 Wild Onion
 Angelica
 Sweet Vernal Grass
 Sea Pink
 Slender Wild Oat
 Coyote Bush
 Marsh Baccharis
 Cabbage
 Black Mustard
 Quaking Grass
 Rip-gut Grass
 Brome
 Soft Chess
 Corn Chrysanthemum
 Ice Plant
 Ice Plant
 Pineapple Weed
 Monterey Cypress
 Scotch Broom
 Orchard Grass
 Live-forever
 Rye Grass
 Willow-herb
 Seaside Daisy
 Filaree
 Filaree
 Wild Buckwheat
 California Poppy
 Foxtail Fescue
 Beach Strawberry
 Bedstraw
 Salal
 Cranesbill
 Cranesbill
 Cudweed
 Gum-plant
 Golden Aster
 Velvet Grass
 Barley
 Cat's Ear
 Douglas Iris
 Mallow
 Aster
 Flax

Fabaceae
 Asteraceae
 Liliaceae
 Apiaceae
 Poaceae
 Plumbaginaceae
 Poaceae
 Asteraceae
 Asteraceae
 Brassicaceae
 Brassicaceae
 Poaceae
 Poaceae
 Poaceae
 Poaceae
 Asteraceae
 Aizoaceae
 Aizoaceae
 Asteraceae
 Cupressaceae
 Fabaceae
 Poaceae
 Crassulaceae
 Poaceae
 Onagraceae
 Asteraceae
 Geraniaceae
 Geraniaceae
 Polygonaceae
 Papaveraceae
 Poaceae
 Rosaceae
 Rubiaceae
 Ericaceae
 Geraniaceae
 Geraniaceae
 Asteraceae
 Asteraceae
 Asteraceae
 Poaceae
 Poaceae
 Asteraceae
 Iridaceae
 Malvaceae
 Asteraceae
 Linaceae

Lobularia maritima
Lolium multiflorum
Lotus spp.
L. corniculatus
Lupinus bicolor
Lupinus littoralis
Marah oreganus
Medicago polymorpha
Melilotus indicus
Oxalis rubra
Plantago coronopus
P. erecta
P. lanceolata
P. maritima ssp. juncooides
Polygonum paronychia
Pteridium aquilinum var. pubescens
Raphanus sativus
Rosa sp.
Rubus discolor
Rubus ursinus
Rumex acetosella
Rumex crispus
Salix lasiolepis
Sanicula arctopoides
Scirpus americanus
Scrophularia californica
Senecio jacobaea
Senecio vulgaris
Sidalcea malvaeflora
Silene gallica
Sisyrinchium bellum
Solidago sp.
Spergularia rubra
Sonchus asper
S. oleraceus
Stachy ajugoides
S. chamissonis
Stellaria media
Trifolium depauperatum
Trifolium dubium
Trifolium fulcatum
Trifolium repens
Trifolium wormskioldii
Triteleia laxa
Vicia spp.
Vinca major

Sweet Alyssum
Italian Rye
Bird's Foot Trefoil
Bird's Foot Trefoil
Lupine
Lupine
Wild Cucumber
Bur-clover
Sweet-clover
Sorrel
Plantain
Plantain
Plantain
Plantain
Knotweed
Bracken Fern
Wild Radish

Himalaya Berry
California Blackberry
Sheep Sorrel
Curly Dock
Willow
Footsteps-of-Spring
Three-square
Figwort, Bee Balm
Tansy Ragwort
Groundsel
Checker

Blue-Eyed-Grass
Goldenrod

Prickly Sow-thistle
Sow-thistle
Hedgenettle
Hedgenettle
Chickweed
Clover
Clover

White Clover
Clover
Ithuriel's spear
Vetch
Periwinkle

Brassicaceae
Poaceae
Fabaceae
Fabaceae
Fabaceae
Fabaceae
Cucurbitaceae
Fabaceae
Fabaceae
Oxalidaceae
Plantaginaceae
Plantaginaceae
Plantaginaceae
Plantaginaceae
Polygonaceae
Pteridaceae
Brassicaceae

Rosaceae
Rosaceae
Polygonaceae
Polygonaceae
Salicaceae
Apiaceae
Cyperaceae
Scrophulariaceae
Asteraceae
Asteraceae
Malvaceae

Iridaceae
Asteraceae
Caryophyllaceae
Asteraceae
Asteraceae
Lamiaceae
Lamiaceae
Caryophyllaceae
Fabaceae
Fabaceae

Fabaceae
Fabaceae
Liliaceae
Fabaceae
Apocynaceae

Vulpia myuros var. *hirsute*

Poaceae

List of plants found on entire parcel

PRELIMINARY CHECKLIST FOR GLASS BEACH NORTH COAST BLUFF SCRUB

(Rare Plants in Bold)

<i>Acacia melanoxylon</i>	Blackwood Acacia	Fabaceae
<i>Achillea millefolium</i>	Yarrow	Asteraceae
# <i>Agrostis blasdalei</i>	Bent Grass	Poaceae
<i>Allium triquetrum</i>	Wild Onion	Liliaceae
<i>Ambrosia chamissonis</i>	Beach Burr	Asteraceae
<i>Amsinkia</i> sp.	Amsinkia	Boraginaceae
<i>Angelica hendersonii</i>	Angelica	Apiaceae
<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	Poaceae
<i>Armeria maritima</i>	Sea Pink	Plumbaginaceae
<i>Avena barbata</i>	Slender Wild Oat	Poaceae
<i>Baccharis pilularis</i>	Coyote Bush	Asteraceae
<i>Baccharis douglasii</i>	Marsh Baccharis	Asteraceae
<i>Blennosperma nanum</i> var. <i>robustum</i>	Blennosperma	Asteraceae
<i>Brassica oleracea</i>	Cabbage	Brassicaceae
<i>Brassica nigra</i>	Black Mustard	Brassicaceae
<i>Briza maxima</i>	Quaking Grass	Poaceae
<i>Brodiaea terrestris</i>	Brodiaea	Liliaceae
<i>Bromus diandrus</i>	Rip-gut Grass	Poaceae
<i>Bromus carinatus</i>	Brome	Poaceae
<i>Bromus mollis</i>	Soft Chess	Poaceae
<i>Cakile maritima</i>	Sea Rocket	Brassicaceae
<i>Calamagrostis nutkaensis</i>	Reedgrass	Poaceae
<i>Calandrinia ciliata</i>	Red Maids	Brassicaceae
<i>Carex obnupta</i>	Sedge	Cyperaceae
<i>Chrysanthemum segetum</i>	Corn Chrysanthemum	Asteraceae
<i>Carpobrotus chilensis</i>	Ice Plant	Aizoaceae
<i>Carpobrotus edulis</i>	Ice Plant	Aizoaceae
<i>Cortaderia jubata</i>	Jubata Grass	Poaceae
<i>Castilleja ambigua</i> ssp. <i>ambigua</i>		Scrophulariaceae
<i>Castilleja mendocinensis</i>	Indian Paintbrush	Scrophulariaceae
<i>Castilleja exserta</i> ssp. <i>latifolia</i>		Scrophulariaceae
<i>Ceanothus</i>		Rhamnaceae
<i>Chamomilla suaveolens</i>	Pincapple Weed	Asteraceae
<i>Cirsium quercetorum</i>	Thistle	Asteraceae
<i>Clarkia davyi</i>		Onagraceae
<i>Claytonia perfoliata</i>	Miner's Lettuce	Portulacaceae
<i>Crocsmia crocosmiflora</i>	Montbretia	Iridaceae
<i>Cupressus macrocarpa</i>	Monterey Cypress	Cupressaceae

<i>Cuscuta</i> sp.	Dodder	Cuscutaceae
<i>Cytisus scoparius</i>	Scotch Broom	Fabaceae
<i>Dactylis glomerata</i>	Orchard Grass	Poaceae
<i>Danthonia californica</i> var. <i>americana</i>	California Oatgrass	Poaceae
<i>Danthonia pilosa</i>	Oatgrass	Poaceae
<i>Deschampsia cespitosa</i> ssp. <i>holciformis</i>	Tufted Hair Grass	Poaceae
<i>Delphinium</i>		
<i>Dudleya farinosa</i>	Live-forever	Crassulaceae
<i>Leymus mollis</i>	Rye Grass	Poaceae
<i>Epilobium paniculatum</i>	Willow-herb	Onagraceae
<i>Equisetum</i> sp.	Horsetail-fern	Equisetaceae
<i>Erigeron glaucus</i>	Seaside Daisy	Asteraceae
<i>Eriophyllum lanatum</i> var. <i>arachnoideum</i>		Asteraceae
<i>Erodium</i> spp.	Filaree	Geraniaceae
<i>Erodium. cicutarium</i>	Filaree	Geraniaceae
<i>Eriogonum latifolium</i>	Wild Buckwheat	Polygonaceae
<i>Erysimum menziesii</i> var. <i>menziesii</i> x <i>concinnum</i>		Brassicaceae
<i>Eschscholzia californica</i>	California Poppy	Papaveraceae
<i>Festuca megalura</i>	Foxtail Fescue	Poaceae
<i>Foeniculum vulgare</i>	Fennel	Apiaceae
<i>Fragaria chiloensis</i>	Beach Strawberry	Rosaceae
<i>Galium</i> sp.	Bedstraw	Rubiaceae
<i>Gaultheria shallon</i>	Salal	Ericaceae
<i>Geranium carolinianum</i>	Cranesbill	Geraniaceae
<i>Geranium molle</i>	Cranesbill	Geraniaceae
<i>Gnaphalium</i> sp.	Cudweed	Asteraceae
<i>Grindelia stricta</i>	Gum-plant	Asteraceae
<i>Habenaria elegans</i> var. <i>maritima</i>	Rein Orchid	Orchidaceae
<i>Heracleum lanatum</i>	Cow Parsnip	Apiaceae
<i>Helenium bolanderi</i>	Sneezeweed	Asteraceae
<i>Hesperervax brevifolia</i>		
<i>Heterotheca sessiliflora</i> ssp. <i>bolanderi</i>	Golden Aster	Asteraceae
<i>Holcus lanatus</i>	Velvet Grass	Poaceae
<i>Hordeum</i> sp.	Barley	Poaceae
<i>Hypochoeris radicata</i>	Cat's Ear	Asteraceae
<i>Iris douglasiana</i>	Douglas Iris	Iridaceae
<i>Juncus</i> spp.	Rush	Juncaceae
<i>Juncus breweri</i>	Rush	Juncaceae
<i>Juncus effusus</i>		
<i>Lasthenia californica</i>	Goldfields	Asteraceae
<i>Lasthenia macrantha</i>		
<i>Lasthenia maritima</i>	Goldfields	Asteraceae
<i>Lavatera arboreus</i>	Mallow	Malvaceae
<i>Layia</i> sp.	Layia	Asteraceae
<i>Lessingia filaginifolia</i> var. <i>californica</i>	Aster	Asteraceae
<i>Linum</i> sp.	Flax	Linaceae

Lobularia maritima
Lolium multiflorum
Lotus spp.
L. corniculatus
Lupinus bicolor
Lupinus littoralis
Maianthemum dilatatum
Marah oreganus
Medicago polymorpha
Melilotus indicus
Mimulus guttatus
Myrica californica
Nemophila menziesii
Oenante sarmentosa
Orobanche grayiana var. *violacea*
Oxalis rubra
Phacelia insularis var. *continentis*
Phacelia ramosissima
Plantago coronopus
P. erecta
P. lanceolata
P. maritima ssp. *juncoides*
Platystemon californicus
Poa douglasii
Polygonum paronychia
Potentilla anserina
Pteridium aquilinum var. *pubescens*
Raphanus sativus
Rosa nutkana.
Rosa sp.
Rubus parviflorus
Rubus discolor
Rubus ursinus
Rumex acetosella
Rumex crassus
Rumex crispus
Salix spp. (*lasiolepis*?)
Sanicula arctopoides
Scirpus americanus
Scrophularia californica
Senecio jacobaea
Senecio vulgaris
Sidalcea malvaeflora
Silene gallica
Sisyrinchium bellum
Solidago sp.

Sweet Alyssum
 Italian Rye
 Bird's Foot Trefoil
 Bird's Foot Trefoil
 Lupine
 Lupine
 False Lily-of-the-valley
 Wild Cucumber
 Bur-clover
 Sweet-clover
 Monkey-flower

Baby Blue-Eyes
 Water Parsley
 Broom Rape
 Sorrel
 Phacelia
 Phacelia
 Plantain
 Plantain
 Plantain
 Plantain
 Cream Cups
 Bluegrass
 Knotweed
 Cinquefoil
 Bracken Fern
 Wild Radish
 Rose

Thimble Berry
 Himalaya Berry
 California Blackberry
 Sheep Sorrel
 Dock
 Curly Dock
 Willow
 Footsteps-of-Spring
 Three-square
 Figwort, Bee Balm
 Tansy Ragwort
 Groundsel
 Checker
 Blue-Eyed-Grass
 Goldenrod

Brassicaceae
 Poaceae
 Fabaceae
 Fabaceae
 Fabaceae
 Fabaceae
 Liliaceae
 Cucurbitaceae
 Fabaceae
 Fabaceae
 Scrophulariaceae

Hydrophyllaceae
 Apiaceae
 Orobanchaceae
 Oxalidaceae
 Hydrophyllaceae
 Hydrophyllaceae
 Plantaginaceae
 Plantaginaceae
 Plantaginaceae
 Plantaginaceae
 Papaveraceae
 Poaceae
 Polygonaceae
 Rosaceae
 Pteridaceae
 Brassicaceae
 Rosaceae

Rosaceae
 Rosaceae
 Rosaceae
 Polygonaceae
 Polygonaceae
 Polygonaceae
 Salicaceae
 Apiaceae
 Cyperaceae
 Scrophulariaceae
 Asteraceae
 Asteraceae
 Malvaceae
 Caryophyllaceae
 Iridaceae
 Asteraceae

<i>Spergularia rubra</i>		Caryophyllaceae
<i>Sonchus asper</i>	Prickly Sow-thistle	Asteraceae
<i>S. oleraceus</i>	Sow-thistle	Asteraceae
<i>Stachy ajugoides</i>	Hedgenettle	Lamiaceae
<i>S. chamissonis</i>	Hedgenettle	Lamiaceae
<i>Stellaria media</i>	Chickweed	Caryophyllaceae
<i>Trifolium depauperatum</i>	Clover	Fabaceae
<i>Trifolium dubium</i>	Clover	Fabaceae
<i>Trifolium fulcatum</i>		
<i>Trifolium repens</i>	White Clover	Fabaceae
<i>Trifolium wormskioldii</i>	Clover	Fabaceae
<i>Triteleia laxa</i>	Ithuriel's spear	Liliaceae
<i>Vicia spp.</i>	Vetch	Fabaceae
<i>Vinca major</i>	Periwinkle	Apocynaceae
<i>Vulpia myuros</i> var. <i>hirsute</i>		Poaceae

11. Description of reference sites visited and phonological development of rare, threatened or endangered plants

Reference sites visited for the following rare plants:

Plant/Family/Notes	CNPS List	R-E-D Code	State/Fed. List	Reference site
<i>Agrostis blasdalei</i>	1B	3-2-3		Todd's Pt; Mackerricher
<i>Angelica lucida</i>	4	1-2-1		Russian Gulch State park
<i>Blennosperma nanum</i> var. <i>robustum</i>	1B	3-2-3		Glass Beach
<i>Campanula californica</i>	1B	2-2-3		Jughandle
<i>Castilleja mendocinensis</i>	1B	2-2-3		Mendocino Headlands
<i>Chorizanthe howellii</i>	1B	3-2-3	CT/FE	Mackerricher
<i>Ceanothus gloriosus</i> var. <i>gloriosus</i>	4	1-1-3		Mendocino Headlands
<i>Erigeron supplex</i>	1B	3-2-3		Chapman Pt, Van Damme
<i>Horkelia marinensis</i>	1B	3-2-3		Inglennook, Mackerricher
<i>Lasthenia macrantha</i> ssp. <i>macrantha</i>	1B	2-2-3		Mendocino Headlands
<i>Lilium maritimum</i>	1B	2-3-3		sites extirpated
<i>Phacelia insularis</i> var. <i>continentis</i>	1B	3-2-3		Mackerricher
<i>Phacelia insularis</i> var. <i>continentis</i>	1B	3-2-3		Mackerricher
<i>Sidalcea calycosa</i> ssp. <i>rhizomata</i>	1B	2-2-3	April-Sept	Navarro Pt
<i>Sidalcea malachroides</i>	1B	2-2-2		Seaside Beach

12. Copies of CNPS survey forms

None attached as no sensitive species were found on the project site

13. References cited, persons contacted, herbaria visited, disposition of voucher specimens.

Abrams, L. 1960. Illustrated Flora of the Pacific States. Vol .1-4 Stanford Univ. Press

Anon. 1/2000, Calif. Dept. Fish & Game SPECIAL PLANT LIST, Natural Diversity Data base
 Anon. US Fish and Wildlife Service Wetland 1988 National List,
<ftp://enterprise.nwi.fws.gov/ecology/list88/region0.txt>
 Anon. CalEPPC (California Exotic Pest Plant Council) web site www.caleppc.org
 Bossard, Carla, J. Randal, and M. Hoshovsky, 2000, Invasive Plants of California Wildlands,
 UC Press
 C. Best, et al. 1996. A Flora of Sonoma County. California Native Plant Society.
 Hickman, James. The Jepson Manual, Higher Plants of California. 1993. Univ. of Calif.
 Press.
 Hitchcock, A.S. Manual of the Grasses of the United States. 1971. Dover Publ. Inc
 Skinner, M. et al. 1994 CNPS Inventory of Rare & Endangered Vascular Plants of
 California, CNPS 5th ed.
 The sixth edition of the CNPS Inventory of Rare & Endangered Vascular Plants of
 California, found on line at <http://cnps.org/rareplants/inventory/6thEdition.htm>

14. Qualifications of field personnel including any special experience with the habitats and special status plants present on the site.

Qualifications for Teresa Sholars:

1975-present Professor, College of the Redwoods, Mendocino Coast Campus; teaching courses in the Identification and Ecology of Mendocino Coast Plants, Lichens, Mushrooms and terrestrial vertebrates, Biology, Forestry, Environmental Science and Sustainable Agriculture
 1975-present Botanical Consultant in Northwestern California and SE Ca.

EDUCATION

1986-90 Graduate studies in the Ph.D. program, Botany (systematic), UC Berkeley

DEGREES AWARDED

1975 M.S., Ecology, UC Davis
 1974 B.S., Environmental Planning & Management, UC Davis

Board of Directors, Rare Plant Coordinator, DKY Chapter, CNPS
 Member Rare Plant Scientific Advisory Committee for the State Wide CNPS

Published : (a partial list)

Ferren, W.R., Jr., D.L. Magney, and T.A. Sholars. 1995. The Future of California Floristics and Systematics: Collecting Guidelines and Documentation Techniques. *Madroño* 42(2):197-210

"Characteristics of Redwood Forests" (the sections on flora, rare plants, lichens and exotic plants) in *The Redwood Forest, History, Ecology and Conservation of the Coast Redwood*, 2000, Ed. Reed Noss, Island Press

Treatment of the perennial *Lupinus* in, *Jepson Manual, Higher Plants of California*, Ed., Hickman, 1993, University of California Press

"Jughandle State Reserve, The Ecological Staircase, A Self Guided Nature Trail", 9 pages, California State Parks, Mendocino Sector

"Pygmy Forest of Mendocino" California's Wild Gardens Ed. P.M. Faber, California Native Plant Society for the Department of Fish and Game.

Floristic Checklists for the following State Parks:

Glass Beach Headlands, Jughandle State Park, MacKerricher State Park, Manchester State Beach, Russian Gulch State Park, Van Damme State Park

Appendix

CNPS RARE AND ENDANGERED PLANT LISTS

(from CNPS.org)

What are these lists?

CNPS maintains an inventory of the plants known to be native to California. The four lists of plants cover only those plants thought to be at risk, and rank the plants in regard to their degree of endangerment today and in the likely future. If species are not considered to be at risk, they are not included on any of the lists.

R.E.D. Codes

The Natural Diversity database of the Department of Fish and Game and CNPS also assign a so-called R-E-D Code. The 'R' is a degree of concern on rarity, the 'E' on endangerment, and the 'D' on distribution.

California Department of Fish and Game Lists

The Natural Diversity database of the Department of Fish and Game maintains its own lists of Endangered and Threatened Plants. Listing provides some protection of the plants under the California Endangered Species Act and it is mandatory that they be fully considered during preparation of environmental documents relating to the California Environmental Quality Act.

U.S. Fish and Wildlife Service Lists

The U.S. Fish and Wildlife Service has two Categories of Listing. These are Listed Species, and Candidate Species, which are taxa for which theinformation on biological vulnerability.....supports the appropriateness of listing as endangered or threatened species.

A PRIMER ON CNPS LISTINGS

List 1A. Presumed Extinct in California

There are currently 34 plants presumed extinct because they have not been seen or collected in the wild for many years (5th edition of the CNPS Inventory, 1994). Most but not all were California endemics. CNPS has made attempts to rediscover these plants but has been unsuccessful. Since the 1988 4th edition of the Inventory 13 plants were removed from List 1A due to rediscovery, and 10 plants were moved onto the list. All of these plants meet the definitions of Sec.1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. Should these plants be rediscovered, it is mandatory that they be fully considered during preparation of environmental documents relating to the California Environmental Quality Act.

List 1B. Rare or Endangered in California and Elsewhere

The 857 plants on this list are rare throughout their range, and all but a few are endemic to California. All are considered vulnerable due to either small numbers, threatened habitat, or both. There were 675 plants in this category in the 1988 4th edition of the Inventory. All of these plants meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code and are eligible for state listing. It is mandatory that they be fully considered during preparation of environmental documents relating to the California Environmental Quality Act.

List 2. Rare and Endangered in California, More Common Elsewhere

Except for being common outside of California, these plants would have been on List 1B. In 1994 there were 272 plants on this list, an increase from 177 plants in 1988. Since passage of the Native Plant Protection Act in 1979, these plants have been protected in California. All of these plants meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code and are eligible for state listing. It is mandatory that they be fully considered during preparation of environmental documents relating to the California Environmental Quality Act.

List 3. Species For Which More Information is Needed.

The 47 plants on this list are plants for which there is insufficient information to either advance them to higher lists or to reject them from all lists. There were 149 plants on this list in 1988. Some of the plants meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Sec. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code and are eligible for state listing. CNPS recommends that List 3 plants be evaluated for consideration during preparation of environmental documents relating to the California Environmental Quality Act.

List 4. Plants of Limited Distribution- A Watch List

The 532 plants on this list are of limited distribution or infrequent throughout a broader area of California, and their vulnerability or susceptibility to threat appears low at this time. While CNPS does not call these plants "rare" from a statewide perspective, they are uncommon enough that their status should be monitored regularly. If the degree of endangerment or rarity change, they may be advanced to a higher list. There were 508 plants on this list in 1988. Very few of the plants meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Sec. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code and are not eligible for state listing. Many of them are significant locally, and CNPS recommends that they be evaluated for consideration during preparation of environmental documents relating to the California Environmental Quality Act.

R-E-D Codes

The Natural Diversity database and CNPS also assign a so-called R-E-D Code. The 'R' is a degree of concern on rarity, the 'E' on endangerment, and the 'D' on distribution.

The 'R' rarity element is:

1. Rare but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
2. Occurrence confined to several populations or to one extended population.
3. Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.

The 'E' endangerment element is:

1. Not endangered.
2. Endangered in a portion of its range.
3. Endangered throughout its range.

The 'D' distribution element is:

1. More or less widespread outside California.
2. Rare outside California.
3. Endemic to California.



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A Division of Bruning Associates, Inc.

CITY OF FORT BRAGG
PLANNING DEPT.

AUG 23 2002

RECEIVED

11740.1

August 23, 2002

Mr. Ken Karlstadt
Mendocino Land Trust, Inc.
P. O. Box 1094
Mendocino, CA 95460

**RE: Engineering Geologic Reconnaissance, Glass Beach Bluffs, 301 West Elm Street,
William J. Blinn Trust, A. P. No. 008-010-24, Fort Bragg, California**

Dear Mr. Karlstadt:

Introduction

This letter presents the results of our engineering geologic reconnaissance of the ocean bluffs at Glass Beach, 301 West Elm Street, Fort Bragg, California. The site is located at the west end of Elm Street in northwest Fort Bragg, as shown on the Vicinity Map, Plate 1. Our reconnaissance was limited to the ocean bluffs at the south end of the property, as indicated by Jason Dose, Associate Planner for the City of Fort Bragg (City). The subject study area extends from the south property line north to a seasonal creek channel, as shown on the 1963, 1981, and 1999 Aerial Photographs, Plates 2, 3, and 4, respectively. The study area also includes the City's storm-drain outfalls just off-site to the south.

We understand that Glass Beach was formerly, up to the 1960's, used as a private landfill. Solid waste has been buried at the site, as well as cast over the bluffs onto the adjacent beaches. Two large, concrete retaining walls were constructed on the bluff faces to facilitate dumping from the upper bluffs onto the beaches. The 1963 Aerial Photograph, Plate 2, shows the dumping operations in progress at the property. The dumping operations were discontinued in the late 1960's, as evidenced by the 1981 aerial photograph, Plate 3.

As per your letter dated July 17, 2002, the Glass Beach property is being considered for sale to the California Department of Parks and Recreation (DPR) pending cleanup of solid waste, as well as removal of the bluff edge retaining walls. Hence, this reconnaissance is to be used in support of environmental review for the planned cleanup, pursuant to the California Environmental Quality Act (CEQA)

The purpose of our reconnaissance was to identify and evaluate the potential impacts to the bluff stability and changes in the bluff retreat rate due to the proposed cleanup activities and removal of the concrete retaining walls. Mitigation measures to reduce potential bluff erosion and destabilization are to be discussed and recommended, as appropriate. The primary issues to be addressed in the study are as follows:

- Identify areas of potential instability with respect to proposed activities.

Attachment 6.
Geotechnical Study

- Provide general evaluation of the effects of proposed activities on the bluff retreat rate and other geologic processes at the site.
- Evaluate and provide recommendations for potential adverse erosion impacts associated with the proposed excavation and removal of debris.
- Identify and provide mitigation measures for potential impacts to the City of Fort Bragg's storm drain outfall due to the removal of the southerly retaining wall.

For this study, our scope of services consisted of the following tasks:

- Researching published geologic maps and reports.
- Evaluating the bluff retreat rate using aerial photographs from years 1963, 1981, and 1999, enlarged to a scale of one inch equals approximately 200 feet.
- Field reconnaissance of the ocean bluffs along the southerly portion of the property, with emphasis on the existing retaining walls and adjacent areas.
- Mapping geologic features in the site vicinity.
- Geologic and engineering analyses of bluff stability.
- Preparation of a written report presenting summaries of our data including photographs of pertinent areas of the bluffs, along with conclusions and recommendations addressing the issues presented above.

Research and Reconnaissance

Our Principal Engineering Geologist met with Jason Dose, City Planner, and performed a reconnaissance of the site on August 5, 2002. Our reconnaissance included examination of soil and bedrock materials exposed on the nearby bluff faces, as well as the adjacent beaches and man-made features. The tidal height ranged from approximately plus 4.4 feet to plus 3.5 feet (above Mean Lower Low Water) during our reconnaissance, according to published tide tables. Our Principal Engineering Geologist had previously observed the site during a recreational visit in about 1977.

As part of our reconnaissance, we studied aerial photographs of the site vicinity dated 1963, 1981, and 1999, enlarged to a scale of one-inch equals approximately 200 feet. The bluff line in the aerial photographs was compared to the existing bluff line in undisturbed areas in order to estimate the relative bluff retreat rate. The results of our aerial photograph study are incorporated into the Site Geology and Soils, and the Conclusions sections of this report.

We also reviewed the following published geologic references and consultant's report:

- Ukiah Sheet, Geologic Map of California, 1960, California Division of Mines and Geology (CDMG);
- Geology and Geomorphic Features Related to Landsliding, Fort Bragg 7.5 Minute Quadrangle, Mendocino County, California, 1983 Open File Report 83-5, CDMG;



- Remedial Action Plan, Glass Beach Property, Fort Bragg, California, May, 2002, SHN Consulting Engineers and Geologists, Inc.

Site Conditions

The subject bluffs consist of three sandy beaches separated by two, small peninsulas surrounded by numerous offshore rocks. Two areas of concern (Areas I and II), as shown on Plate 4, were addressed in the SHN report. Area I, at the south end of the property, consists of a south-facing bluff edge retaining wall above a sandy beach, as shown on Site Photograph A, Plate 5. Two City storm-drain pipes outlet at the bluff edge approximately 50 feet southeast of the Area I retaining wall, as shown on Site Photograph B, Plate 6. A close up of the Area I retaining wall, and a debris-filled gully west of the wall, is shown in Site Photograph C, Plate 7.

The approximately 12-inch and 36-inch diameter storm-drain pipes extend one to two feet beyond the upper bluff edge. The pipes outlet partially onto the bedrock and partially onto rust-cemented debris and boulders, before flowing across the beach to the ocean. A small, steady flow of water was coming from the larger pipe during our August, 2002, reconnaissance. As shown on Plate 7, the Area I retaining wall is partially founded upon bedrock, however, the wall has no footing and is mostly undermined. The wall extends from the bluff top to within a few feet above the bluff toe. There are several, relatively-large voids under and behind the wall. The bluff faces are mostly bare rock with a cover of grasses over the bluff tops.

A small, west-trending peninsula separates the Area I and II beaches. The sides of the peninsula are surrounded by water. A small sea cave, approximately 5 feet wide by about 5 feet high, is located at the west end of the peninsula. An area of debris is located on the bluff northeast of the peninsula. The Area II retaining wall is just north of this debris-filled bluff. As shown on Plates 8 and 9, the retaining wall is partially founded on bedrock, however it has no footing and is mostly undermined. There are several large voids under, and below the wall. The concrete wall has several, visible cold joints. Below the center of the wall is a lower, older(?) section of wall. Much of this lower wall appears to have eroded away, as evidenced by several, separate wall pieces, still attached to the bedrock under the upper wall. The bluff faces within Area II are mostly bare rock. The bluff tops are covered by grasses or ice plant. The bluffs north of the Area II retaining wall vicinity are filled with debris, as shown on Plate 10.

A larger, northwest-trending peninsula is located northwest of the Area II wall and beach. The peninsula appears to have been graded flat (cut to within about 5 to 10 feet above Mean Sea Level) during, or prior to the dumping operations. The 1963 aerial photograph shows a graded ramp for vehicle access from the bluff down to the peninsula. Plate 11 is taken from the peninsula looking east-southeast toward the ramp, with the Area II retaining wall in the distance. The northerly seasonal creek (limit of the study area) empties onto the beach northeast of the peninsula. As shown on Plate 12, the bluffs above this beach are mostly covered with ice plant. Inland from the bluff edge, ice plant covers the hummocky ground surface where numerous debris mounds are probably buried.



Site Geology and Soils

The site bedrock exposed on the bluff faces and the offshore rocks in the site vicinity consists of Cretaceous-Tertiary Period coastal belt Franciscan Complex sedimentary rocks. These rocks primarily consist of sandstone and shale with minor chert. The bedrock is brown, gray and dark gray, little to closely fractured, moderate in hardness to hard, and moderate to little weathered.

There is a consistent, northwest-trending strike where bedding is exposed within the Franciscan Complex rocks. This accounts for the northwest linear trend of most of the peninsulas and offshore rocks in the vicinity. The rocks in the Area I vicinity have a northwest-trending strike and dip steeply to the west-southwest at 85 degrees from horizontal to near vertical. The rocks in the Area II vicinity have a northwest-trending strike, but dip steeply to the east-northeast at 65 degrees from horizontal to near vertical. The difference in dip direction may be the result of an anticlinal fold, or may be due to ancient faulting. Several, inactive fault traces were observed within the Areas I and II bluffs. The northwest-trending faults consist of near vertical zones of sheared rock, several inches to several feet wide. None of the published references that we reviewed identified faults on, or trending towards the property.

The bluffs at the north end of the study area are covered with approximately three feet of poorly consolidated Pleistocene Epoch terrace deposits. The terrace sediments were deposited on wave-cut platforms during sea level fluctuations caused by periods of glaciation. These sediments consist of light brown silty sand with some sandy silt and gravel. No terrace deposits were observed on the bluffs elsewhere at the site.

No landslides were observed in the study area. Erosion is occurring within the weaker rock zones and fill soils on the bluff faces. Rusted metal debris are being eroded from the fill deposits. Surface water runoff during the rainy season appears to be flowing over the bluff edges at several locations, thereby eroding the fill and native soils and deeply weathered rock.

The Coast Ranges geomorphic province is in a zone of high seismic activity associated with the San Andreas Fault System, which passes through the Mendocino coastal area. The active San Andreas Fault is located offshore, approximately 6.5 miles (10.5 kilometers) southwest of the site.

Discussion and Conclusions

The natural rate of erosion is difficult to determine at this site, due to the past disturbance from the dumping operations throughout the bluffs. The retreat rate of the "undisturbed" peninsulas is relatively minimal; the very hard rock points are erosion-resistant masses. Based upon our reconnaissance and aerial photograph study, we estimate the average peninsula retreat rate is on the order of one to two inches per year. Portions of the debris-filled bluffs have significantly higher erosion rates. The bluff between the hard rock mass at the north end of the Area II retaining wall and the ramp onto the northwest-trending peninsula has eroded back approximately 40 to 45 feet since the 1963 aerial photograph. The bluffs south of the seasonal creek channel have been eroded back about 30 to 35 feet during this same time period. Thus, the



erosion rate of parts of the disturbed bluffs, from 1963 to the present, has been an average of about 10 to 12 inches per year. However, as these bluffs erode further back, they are less often reached by the ocean waves. Thus the present retreat rate may be gradually diminishing, except where weaker fill soils are being exposed.

Based upon past studies of other Mendocino County coastal sites with similar lithology, bluff heights, near-shore beach and rock conditions, off-shore rock configurations, exposure to northwest prevailing wave direction, etc., we estimate that the "natural" bluff retreat rate (not considering the very hard rock masses that form points, peninsulas, and off-shore rocks) is on the order of two to three inches per year. The 40-plus year old, concrete retaining walls, which presumably were once keyed into the rock, but are now undermined and exposed, crudely verify this retreat rate. Based upon the above erosion constraints, our responses to the primary issues identified in the Introduction to this report are as follows:

- Areas of potential instability are presently the soil and debris filled portions of the bluffs.
- The effects of proposed activities (retaining wall and debris removals) at the site will remove the materials most currently susceptible to erosion.
- Removal of the debris and associated fill soils will expose the underlying, more erosion-resistant rock, thus restoring the previous "natural" erosion rate of two to three inches per year. This conclusion is only valid provided that loose soils uncovered by the excavations are removed from areas exposed to wave action.
- The City's storm drain outfall should be unaffected by removal of the Area I retaining wall. The rocks exposed by the wall removal should erode at the "natural" average rate of two to three inches per year. Storm waves should not be adversely deflected by the wall removal toward the outfall site. However, some of the debris in the splash area below the pipes is cemented by rust. If this debris is removed, some of the natural rock may be displaced, possibly increasing the erosion rate and, in time, undermining the pipe outlets.

Recommendations

Debris removal operations should be observed by BACE to see that erosion-susceptible soils and loosened rocks are removed from areas exposed to wave action. Clean soil and rock materials can be placed in debris excavation pits back of the bluffs (outside of wetlands), as appropriate. Except for removal of hazardous (i.e., sharp, pointed, or caustic) objects, the rust-cemented debris under the city's storm drain pipes should remain for erosion protection.

Limitations

This reconnaissance of the ocean bluffs was performed in accordance with the usual and current standards of the profession, as they relate to this and similar localities. No other warranty, expressed or implied, is provided as to the conclusions and professional advice presented in this report. Our conclusions are based upon reasonable geotechnical and engineering interpretation of available data.




Mr. Ken Karlstadt
August 23, 2002
Page 6

11740.1

Changes in the condition of a site can occur with the passage of time, whether they are due to natural events or to human activities on this, or adjacent sites. In addition, changes in applicable or appropriate codes and standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, this report may become invalidated wholly or partially by changes outside of our control. Therefore, this report is subject to review and revision as changed conditions are identified.

We trust the above information suits your needs at this time. Please call if you have any questions.

Respectfully Submitted,


Erik E. Olsborg
Engineering Geologist - 1072

EEO/TPB/mjh

Two copies submitted

Cc: Ms. Linda Ruffing, City of Fort Bragg
Ms. Moira McEnespy, Coastal Conservancy





BACE Geospatial
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Web: www.bace.mil

1983 AERIAL PHOTOGRAPH
CLASSIFIED
EXCLUDED FROM AUTOMATIC
DOWNGRADING AND
DECLASSIFICATION



NOT TO SCALE



BACE Geotechnica
a div. of
Building Associates Inc.
707.536-0780

Job No. 117401
Asst. S.E.O.
Date 8-20-02

1981 AERIAL PHOTOGRAPH
GLASS BEACH
Fort Bragg, California

DATE
3



NOT TO SCALE



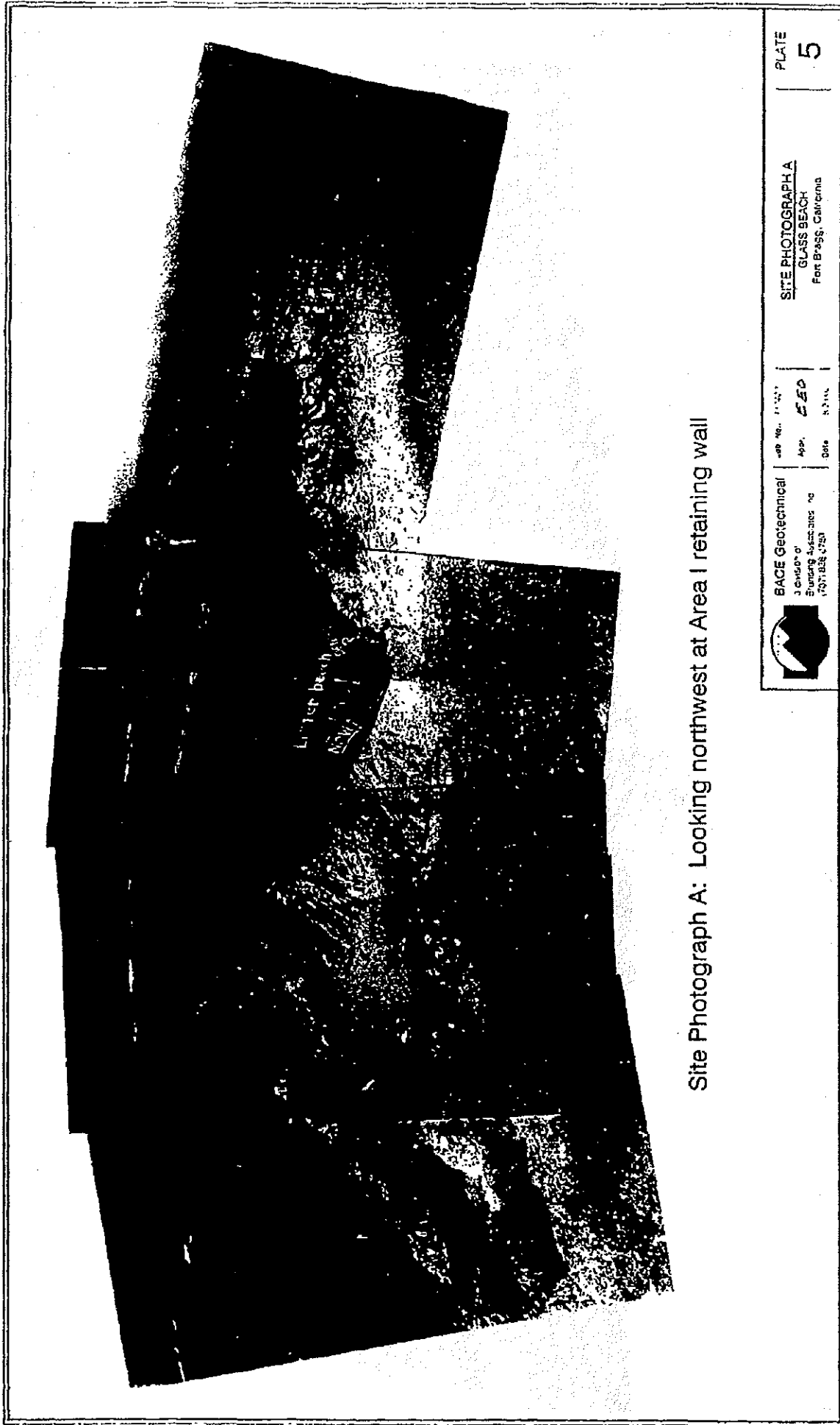
BAGE Geotechnical
a division of
Bunting Associates Inc.
707.838.0760

Job No. 117201
Appr. *EEO*
Date 4/25/02

1999 AERIAL PHOTOGRAPH
GLASS BEACH
Fort Bragg, California

PLATE

4



Site Photograph A: Looking northwest at Area I retaining wall



BACE Geotechnical
3050 N. 10th St.
Suite 100
Fort Bragg, CA 94733

App. No. 11-001
App. EED
Date 8/1/11

SITE PHOTOGRAPH A
GLASS BEACH
Fort Bragg, California



Site Photograph-B: Looking east at Area I retaining wall and City of Fort Bragg storm-drain outlets



BACE Geotechnical
a division of
Burrington Associates, Inc.
(707) 838-4783

JOB NO. "1140"
Appr. 5/80
Date 8/23/82

SITE PHOTOGRAPH B
GLASS BEACH
Fort Bragg, California

PLATE
6



Site Photograph C: Looking north-northeast debris filled gully and Area I retaining wall



BACE Geotechnical
801 S. 1st St.
Suite 100
1701, 838-4700

Job No. 11120
Appr. EED
Date 8/23/01

SITE PHOTOGRAPH C
GLASS BEACH
Fort Bragg, California

PLATE
7



Site Photograph D: Looking northeast at Area II retaining wall

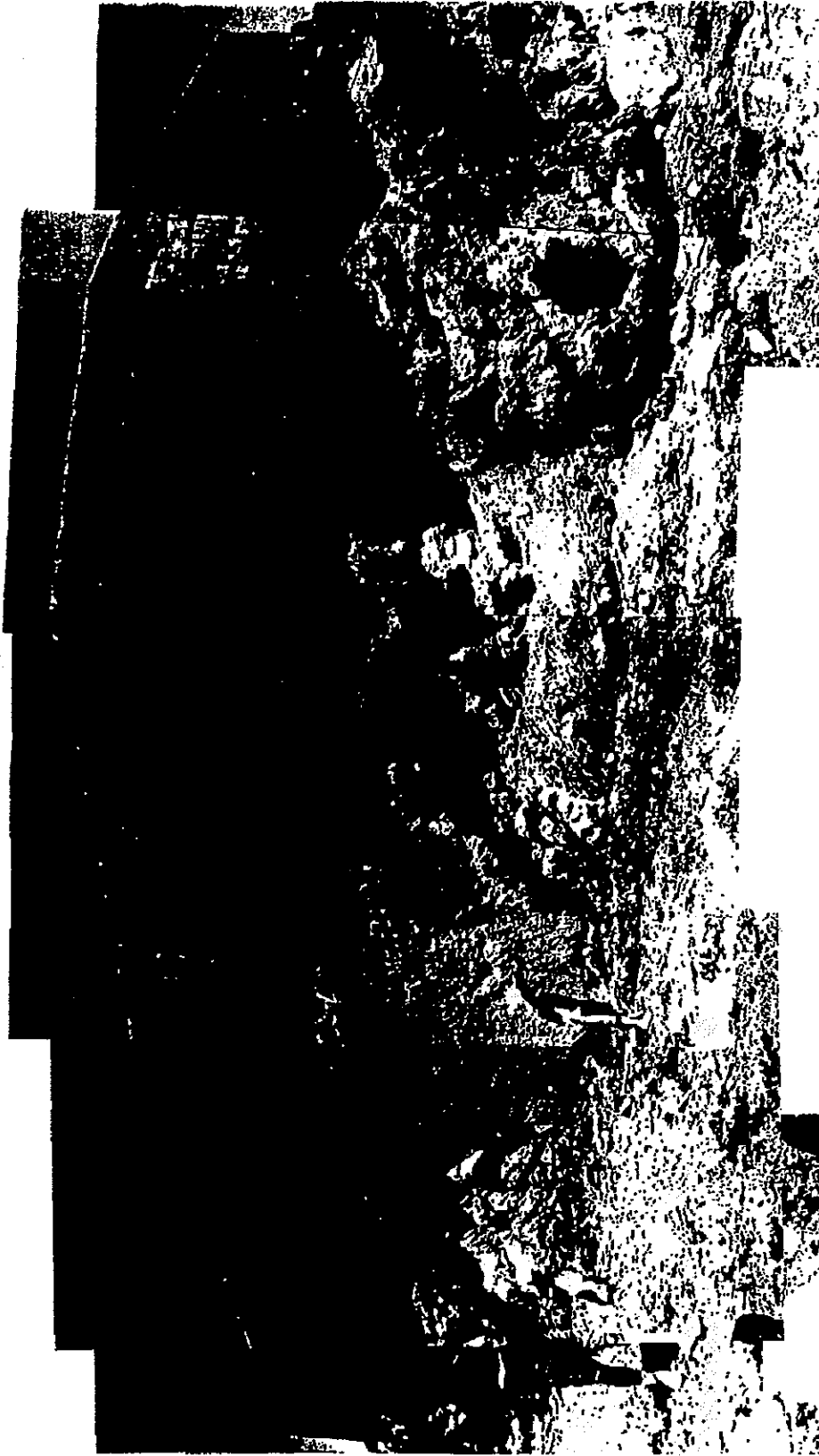


BACE Geotechnical
a division of
Burlington Associates, Inc.
1707, 838-0760

Job No. 111401
Appr. SED
Date 1/23/02

SITE PHOTOGRAPH D
GLASS BEACH
Fort Bragg, California

PLATE
8



Site Photograph E: Close-up of Area II retaining wall



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Bryant/Young Associates, Inc.
(707) 538-0780

Job No. 11712.1
Appr. CEO
Date 8/22/02

SITE PHOTOGRAPH E
GLASS BEACH
Fort Bragg, California

PLATE
9



Site Photograph F: Debris-filled bluffs north of the Area II retaining wall

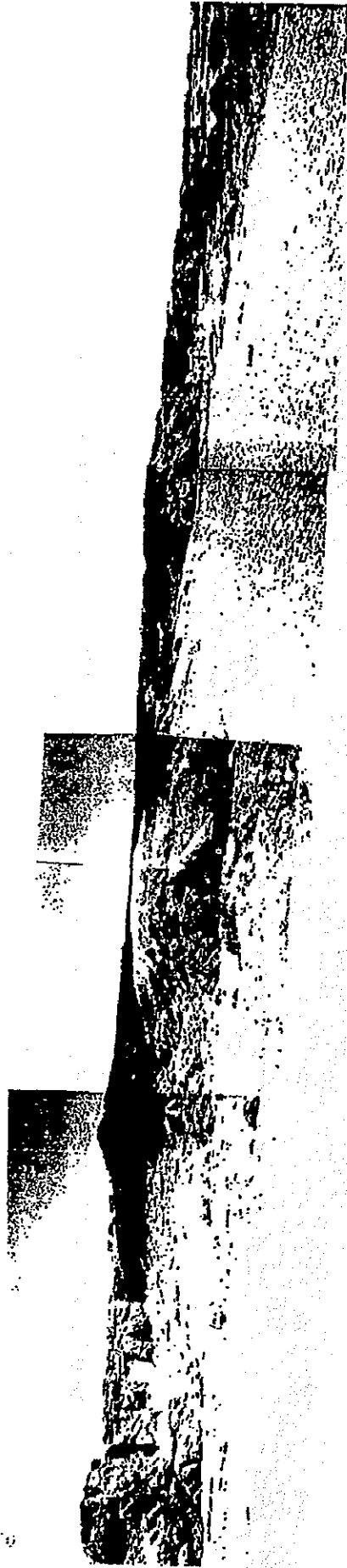


BACE Geotechnical
a division of
Bruckner Associates, Inc.
(607) 538-0730

Job No. 117101
Asst. S.E.O.
Date: 12/12

SITE PHOTOGRAPH F
GLASS BEACH
Fort Bragg, California

PLATE
10



Site Photograph G: Looking east-southeast from the northwest-trending peninsula



BACE Geotechnical
A Division of
Bearing Consultants, Inc.
1001-222-0750

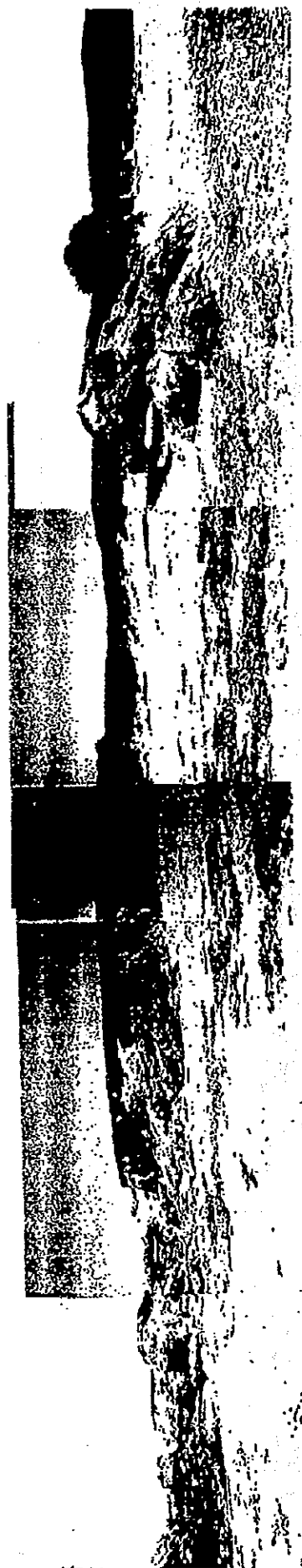
Job No. 11111
Date 11/1/11

SITE PHOTOGRAPH G

G-ASS BEACH
Fort Bragg, California

PLATE

11



Site Photograph H: Looking east to northeast at the northerly seasonal creek channel

PLATE 12

SITE PHOTOGRAPH H
GLASS BEACH
Fort Bragg California

BACE Geotechnical
10000 C
Surveying
1700 E 1/2 S 1/2 E
Map
Date
650





CITY OF FORT BRAGG

Incorporated August 5, 1889
416 N. Franklin St.
Fort Bragg, CA 95437
FAX 707-961-2802

REQUEST FOR COMMENTS

Date: June 24, 2002

To:	XX City Manager	XX Public Works Department
	XX Fire Department	XX Police Department
	XX Finance Department	XX Community Development Department
	XX Caltrans - District 1	XX Moira McEnespy - Coastal Conservancy
	XX Air Quality Management District	XX State Historic Preservation Office
	XX Robert Merrill - CA Coastal Commission	XX Department of Fish & Game - Yountville
	XX US Fish and Wildlife Services	XX Sonoma State University
	XX Mendocino County Planning Dept.	XX State Lands Commission
	XX California Native Plant Society	
	XX David Koppel - County of Mendocino Public Health Department	
	XX Luis Rivera - North Coast Regional Water Quality Control Board	
	XX Greg Picard - Department of Parks and Recreation, Mendocino Sector	
	XX Paul Cayler - County of Mendocino Solid Waste Division	
	XX Lono A. Tyson, Jr. - CA Integrated Waste Management Board	

FILE NUMBER(S): CDP 7-02

APPLICANT: William J. Blinn Trust

PROJECT: Coastal Development Permit for implementation of a Remedial Action Plan (RAP) for the 38± acre Glass Beach property. The RAP presents guidelines for remediation of the site through excavation of approximately 2,000 cubic yards of buried refuse and soils from two locations near the westerly terminus of site access roads which extend west from Elm Street. The project also includes the removal of a large pile of concrete from the northern end of the property and removal of two concrete retaining walls/abutments from the coastal bluff. Excavated materials will be transported to a Class I or Class II disposal facility. Excavation depths range from approximately 4-10 feet below the ground surface. All areas to be excavated, as well as staging and temporary soils/refuse stockpiling areas, will be temporarily fenced and secured.

LOCATION: 301 West Elm Street (APN 008-010-24)

The above referenced project has been submitted for review. Copies of material describing the project are attached to provide additional information.

RESPONSE DUE DATE: July 15, 2002. If no response is received by this date, we will assume no recommendations or comments are forthcoming.

XX The City is requesting comments concerning this project. Comments received will be used by the City in making an environmental determination on the project.

Please send your response to the address above. We will need the name of a contact person in your agency. Thank you in advance for your time and effort in reviewing this project.

If you have any questions, please contact Associate Planner Jason Dose at (707)961-2827 or e-mail at jdose@ci.fort-bragg.ca.us.

ADMINISTRATION/ENGINEERING
(707) 961-2823

FINANCE/WATER WORKS
(707) 961-2825

Attachment 7. Request for Comments and Agency Comments Received
--

CDP 7-02; WILLIAM J BLINN
TRUST; 301 WEST ELM STREET;
REMEDIAL ACTION PLAN;
REQUEST FOR COMMENTS
MAILING LABELS; AP#008-010-24;
PAGE 1 OF 1

CONNIE JACKSON
CITY MANAGER

DAVID KOPPEL
COUNTY OF MENDOCINO
PUBLIC HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
501 LOW GAP RD ROOM 1326
UKIAH CA 95482

LUIS RIVERA
NORTH COAST REGIONAL WATER
QUALITY CONTROL BOARD
5550 SKYLANE BLVD STE A
SANTA ROSA CA 95403

GREG PICARD
DEPARTMENT OF PARKS AND
RECREATION, MENDOCINO SECTOR
P O BOX 440
MENDOCINO CA 95460

MOIRA MCENESPY
COASTAL CONSERVANCY
1330 BROADWAY, 11TH FLOOR
OAKLAND CA 94612-2530

PAUL CAYLER
COUNTY OF MENDOCINO
SOLID WASTE DIVISION
599 LOW GAP RD
UKIAH CA 95482

LONO A TYSON JR
WASTE MANAGEMENT ENGINEER
CA INTEGRATED WASTE
MANAGEMENT BOARD
P O BOX 4025
SACRAMENTO CA 95812-4025

AIR QUALITY MANAGEMENT
DISTRICT
ATTN: CHRIS BROWN
306 E GOBBI ST
UKIAH CA 95482

CA COASTAL COMMISSION
ATTN: ROBERT MERRILL
P O BOX 4908
EUREKA CA 95502-4908

DEPARTMENT OF FISH & GAME
ATTN: CARL WILCOX
P O BOX 47
YOUNTVILLE CA 94599

US FISH AND WILDLIFE SERVICE
ATTN: MATHEW VANDENBERG
3310 EL CAMINO STE 130
SACRAMENTO CA 95821-6340

SONOMA STATE UNIVERSITY
HISTORICAL RESOURCES
INFORMATION SYSTEM
NORTHWEST INFORMATION CENTER
1801 E COTATI AVE
ROHNERT PARK CA 94928-3609

CALTRANS - DISTRICT 1
ATTN: REX JACKMAN
1656 UNION ST ROOM 203
EUREKA CA 95501

MENDOCINO COUNTY PLANNING
DEPARTMENT
501 LOW GAP RD RM# 1440
UKIAH CA 95482

STATE LANDS COMMISSION
DIVISION OF LAND MANAGEMENT
100 HOWE AVE STE 100 SOUTH
SACRAMENTO CA 95825-8202

STATE HISTORIC PRESERVATION
OFFICE
P O BOX 942896
SACRAMENTO CA 94296-0001

CA NATIVE PLANT SOCIETY
DORTHY KING YOUNG CHAPTER
ATTENTION LORI HUBBART
PO BOX 985
POINT ARENA, CA 95468

PUBLIC WORKS DEPARTMENT
DAVE GOBLE

FINANCE DEPARTMENT
ANEE AZAD

POLICE DEPARTMENT
BRUCE CUMMING

FORT BRAGG FIRE DEPARTMENT
STEVE WELLS



CITY OF FORT BRAGG

Incorporated August 5, 1889

416 N. Franklin St.
Fort Bragg, CA 95437
FAX 707-961-2802

July 26, 2002

Mr. Randy Stemler
California Coastal Commission
North Coast District Office
710 E Street, Suite 200
Eureka, CA 95501-1865

SUBJECT: Response to Coastal Commission Staff Comments on Proposed Site
Remediation for Glass Beach (CDP 7-02)

Dear Randy:

Thank you for your timely response to the Request for Comments on the remedial action plan for the proposed clean-up of buried refuse and contaminated soils on the 38± acre Glass Beach property in the City of Fort Bragg. The following information is provided in response to your comments.

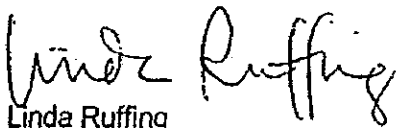
- (1) All proposed activities are above the mean high tide line and there is no "former tideland" that has been filled on the property. There is some scattered debris on the beaches that will be removed, but again this will only occur above the mean high tide line. As such, it is our understanding that the project is located entirely within the City's jurisdiction for coastal development permits.
- (2) A botanical survey is being prepared for the areas which will be disturbed. This has been required because there are rare plants in the site vicinity, and there is the potential for the project to disturb riparian habitat. We do not believe the project will adversely affect any animal population or habitat. There are no rare, endangered or protected animal species on the site.
- (3) You note that the remediation work will generate approximately 133 truck trips and recommend preparation of a traffic study. Truck traffic will travel on Elm Street and enter Main Street at a signalized intersection. We do not believe that the short-term, temporary increase in truck traffic warrants a traffic study.
- (4) The proposed backfilling of imported material has been eliminated from the project description. The refuse will be removed and the site will be recontoured to eliminate any hazardous embankments, to ensure continued public access routes, and to minimize potential erosion impacts. The removal of refuse will return the site to a condition which approximates its natural contours.
- (5) You state that "a more thorough plan with detailed sampling protocol is needed for determining clean closure." The Regional Water Quality Control Board is responsible for review and approval of the Remedial Action Plan. They are also

responsible for certification of the "clean closure" of the site following completion of the remediation work.

- (6) A geotechnical study is being conducted which will evaluate the potential impact of removal of the retaining walls. It will address potential slope stability issues and bluff erosion issues on the site and provide mitigation measures, as needed, to address impacts. The environmental review will not address liability issues. The site is presently private property and the prescriptive use of the site has not been perfected through the courts. Should State Parks assume ownership of the property, as proposed, potential liability issues will be addressed through their management procedures.

We expect that a Mitigated Negative Declaration will be distributed for public and agency review towards the end of August. A copy will be transmitted to Coastal Commission staff for review and comment. Please feel free to contact me at (707)961-2827, if you have any questions or would like to discuss this project further. Perhaps next time you are in Fort Bragg, we can take a field trip out to the Glass Beach property.

Sincerely,



Linda Ruffing
Community Development Director

Cc: Bob Merrill, California Coastal Commission
Jason Dose, Associate Planner
Connie Jackson, City Manager
Maira McEnespy, Coastal Conservancy
Lono Tyson, CIWMB
Ken Karlstad, Mendocino Land Trust

Jew

CITY OF FORT BRAGG

416 NORTH FRANKLIN ST., FORT BRAGG, CA 95437
PHONE 707/961-2827 FAX 707/961-2802

MEMORANDUM

DATE: July 26, 2002
TO: Moira McEnespy, Coastal Conservancy
Lono Tyson, CIWMB
Ken Karlstad, Mendocino Land Trust
FROM: Linda Ruffing, Community Development Director
SUBJECT: Glass Beach Remediation (CDP 7-02) -- Agency Responses to Requests for Comments

For your information, attached are copies of the three letters which were received from agencies responding to the Request for Comments on the Glass Beach Remediation project:

July 8, 2002	Letter from Caltrans
July 8, 2002	Letter from California Historical Resources Information System
July 15, 2002	Letter from California Coastal Commission

Also attached is a July 26, 2002 response from the City to the issues raised in the California Coastal Commission's letter.

Please contact either Associate Planner Jason Dose or me, if you have any questions.

Cc: Connie Jackson, City Manager

DEPARTMENT OF TRANSPORTATION
DISTRICT 1, P. O. BOX 3700
EUREKA, CA 95502-3700
PHONE (707) 445-6412
FAX (707) 441-5869
TTY (707) 445-6463

RECEIVED

JUL 17 2002

CITY OF FORT BRAGG
PLANNING DEPT.

Flex your power!
Be energy efficient!

July 9, 2002

1-MEN-1-17.04
CDP 7-02
William J. Blinn Trust
Remedial Action Plan

Jason Dose
Associate Planner
City of Fort Bragg
416 N. Franklin Street
Fort Bragg, CA 95437

Dear Mr. Dose:

Thank you for giving Caltrans the opportunity to comment on the proposed Coastal Development Permit for implementation of a Remedial Action Plan at the Glass Beach Property in Fort Bragg. The project is located at 301 West Elm Street (AP# 008-010-24). We have reviewed the proposal, and we offer the following comment:

We recommend that the City of Fort Bragg limit the transport schedule for excavated material to non-peak traffic periods. The number of hauling trips should also be limited to less than 10 trucks per hour.

If you have questions or need further assistance, please contact me at the number above, or Brian Travis of District 1 Community Planning at: (707) 441-5812.

Sincerely,



Rex Jackman,
Transportation Planner
Caltrans District 1 Community Planning

JUL 17 2002

CALIFORNIA COASTAL COMMISSION

NORTH COAST DISTRICT OFFICE

MAILING ADDRESS:

710 E STREET • SUITE 200

P. O. BOX 4908

EUREKA, CA 95501-1865

EUREKA, CA 95502-4908

TELEPHONE (707) 445-7833

FACSIMILE (707) 445-7877



July 15, 2002

RECEIVED

JUL 17 2002

Jason Dose
Community Development Associate Planner
City of Fort Bragg
416 N. Franklin Street
Fort Bragg, CA 95437

Dear Jason Dose:

This letter is in response to your request for comments regarding the application by William J. Blinn Trust (CDP 7-02) to implement a remedial action plan (RAP) for the clean up of buried refuse and contaminated soils on the approximately 38-acre Glass Beach property located at 301 West Elm Street (APN 008-010-24).

In general, Coastal Commission staff views the project favorable, but has several comments regarding additional information that should be provided to assess the impacts of the proposed project and its conformance to the Coastal Act and Fort Bragg LCP. First, we understand that portions of the project may be located in areas that are subject to tidal action or subject to the public trust as former tideland that were filled. Such areas are within the Commission's coastal development permit jurisdiction. The remainder of the project is within the Commission's appeal jurisdiction. A complete discussion of activities proposed within Commission jurisdiction, including any removal of debris on or along Glass Beach, would provide information necessary for determining how the Commission would process any needed coastal development permit application for development within the Commission's jurisdiction.

Second, a biological assessment should be prepared that includes animal species as well as sensitive plants.

Third, the removal of 2,000 cubic yards of soil will generate somewhere on the order of 133 20-yard, semi-end-dump truck trips. A traffic study including an analysis of truck trips should be provided.

Fourth, excavated areas are proposed to be backfilled with clean imported material up to grade level. These backfilled areas need a slope stability assessment with analysis of the potential for erosion of the backfill material; and provision of mitigation measures to limit or prevent impacts.

Fifth, a more thorough plan with detailed sampling protocol is needed for determining "clean closure."

JUL 17 2002

Finally, an assessment of the potential impact of removing the retaining walls is needed; including a discussion of slope stability, increased coastal bluff erosion, liability, and mitigation measures necessary to limit or prevent impacts. Site plans should include aerial photo coverage. Location of the retaining walls to be removed should be identified in regard to the mean high tide line.

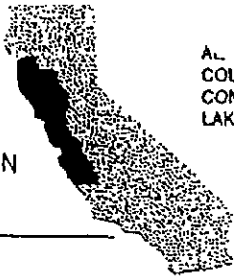
Thank you for providing this opportunity to comment on this proposed project. If you have any questions, please don't hesitate to call.

Sincerely,



Randall Stemler
Coastal Program Analyst

CALIFORNIA
HISTORICAL
RESOURCES
INFORMATION
SYSTEM



ALAMEDA
COLUSA
CONTRA COSTA
LAKE

MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO

SAN MATEO
SANTA CLARA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
1303 Maurice Avenue
Rohnert Park, California 94928-3609
Tel: 707.664.0880 • Fax: 707.664.0890
E-mail: nwic@sonoma.edu

8 July 2002

File No.: 01-ME-96

Mr. Jason Dose
City of Fort Bragg
416 N. Franklin Street
Fort Bragg CA 95437

re: CDP7-02: Glass Beach Property: 301 West Elm Street (APN 008-010-24)

Dear Mr. Dose:

Records at this office were reviewed to determine if this project could adversely affect historical resources. The review for possible historic structures, however, was limited to references currently in our office. The Office of Historic Preservation has determined that any building or structure 45 years or older may be of historic value. Therefore, if the project area contains such properties they should be evaluated by an architectural historian prior to commencement of project activities. Please note that use of the term historical resources includes both archaeological sites and historic structures.

XX The proposed project area contains the archaeological site(s) (CA-MEN-1401H, CA-MEN-1821). Surface evidence of the prehistoric-period site consists of Fire Cracked Rock, chert flakes and obsidian. The historic site consists of a historic period dump. Therefore, it is recommended that a professional archaeologist develop a project specific site treatment plan for these archaeological and historical resources.

XX The proposed project area has the possibility of containing unrecorded archaeological site(s). A study is recommended prior to commencement of project activities.

_____ The proposed project area contains a listed historic structure (). See recommendations in the comments section below.

_____ Study # _____ identified no historical resources. Further study for historical resources is not recommended.

_____ There is a low possibility of historical resources. Further study for historical resources is not recommended.


XX The guidelines for implementation of the California Register for Historical Resources (Cal Register) criteria for evaluation of historical properties have been developed by the State Office of Historic Preservation. For purposes of CEQA, all identified archaeological sites should be evaluated using the Cal Register.

XX Our review is based on scientific information. In addition, we recommend you contact the local tribe(s) regarding traditional, cultural and religious values.

_____ Comments:

If archaeological resources are encountered during the project, work in the immediate vicinity of the finds should be halted until a qualified archaeologist has evaluated the situation. If you have any questions please give us a call (707) 664-0880.

Sincerely,


K. Thorne, for
Leigh Jordan
Coordinator



CITY OF FORT BRAGG

Incorporated August 5, 1889
416 N. Franklin St.
Fort Bragg, CA 95437
FAX 707-961-2802

July 26, 2002

Mr. Randy Stemler
California Coastal Commission
North Coast District Office
710 E Street, Suite 200
Eureka, CA 95501-1865

SUBJECT: Response to Coastal Commission Staff Comments on Proposed Site
Remediation for Glass Beach (CDP 7-02)

Dear Randy:

Thank you for your timely response to the Request for Comments on the remedial action plan for the proposed clean-up of buried refuse and contaminated soils on the 38± acre Glass Beach property in the City of Fort Bragg. The following information is provided in response to your comments.

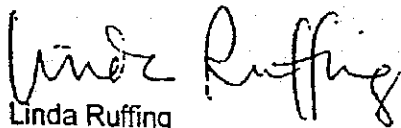
- (1) All proposed activities are above the mean high tide line and there is no "former tideland" that has been filled on the property. There is some scattered debris on the beaches that will be removed, but again this will only occur above the mean high tide line. As such, it is our understanding that the project is located entirely within the City's jurisdiction for coastal development permits.
- (2) A botanical survey is being prepared for the areas which will be disturbed. This has been required because there are rare plants in the site vicinity, and there is the potential for the project to disturb riparian habitat. We do not believe the project will adversely affect any animal population or habitat. There are no rare, endangered or protected animal species on the site.
- (3) You note that the remediation work will generate approximately 133 truck trips and recommend preparation of a traffic study. Truck traffic will travel on Elm Street and enter Main Street at a signalized intersection. We do not believe that the short-term, temporary increase in truck traffic warrants a traffic study.
- (4) The proposed backfilling of imported material has been eliminated from the project description. The refuse will be removed and the site will be recontoured to eliminate any hazardous embankments, to ensure continued public access routes, and to minimize potential erosion impacts. The removal of refuse will return the site to a condition which approximates it's natural contours.
- (5) You state that "a more thorough plan with detailed sampling protocol is needed for determining clean closure." The Regional Water Quality Control Board is responsible for review and approval of the Remedial Action Plan. They are also

responsible for certification of the "clean closure" of the site following completion of the remediation work.

- (6) A geotechnical study is being conducted which will evaluate the potential impact of removal of the retaining walls. It will address potential slope stability issues and bluff erosion issues on the site and provide mitigation measures, as needed, to address impacts. The environmental review will not address liability issues. The site is presently private property and the prescriptive use of the site has not been perfected through the courts. Should State Parks assume ownership of the property, as proposed, potential liability issues will be addressed through their management procedures.

We expect that a Mitigated Negative Declaration will be distributed for public and agency review towards the end of August. A copy will be transmitted to Coastal Commission staff for review and comment. Please feel free to contact me at (707)961-2827, if you have any questions or would like to discuss this project further. Perhaps next time you are in Fort Bragg, we can take a field trip out to the Glass Beach property.

Sincerely,



Linda Ruffing
Community Development Director

Cc: Bob Merrill, California Coastal Commission
Jason Dose, Associate Planner
Connie Jackson, City Manager
Maira McEnespy, Coastal Conservancy
Lono Tyson, CIWMB
Ken Karlstad, Mendocino Land Trust



CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash • Eureka, CA 95501-2138 • 707-441-8855 • Fax 707-441-8877 • info@shn-eureka.com

RWQCB
REGION 1

Reference: 099215

JUL 19 2002

July 17, 2002

<input type="checkbox"/> SHW	<input type="checkbox"/> FCR	<input type="checkbox"/>
<input type="checkbox"/> RLT	<input checked="" type="checkbox"/> LGR	<input type="checkbox"/> KAD
<input type="checkbox"/> NPO	<input type="checkbox"/> RSG	<input type="checkbox"/> EJI

Mr. Craig Hunt

California Regional Water Quality Control Board, North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403

CSH 7/22/2

**SUBJECT: REMEDIAL ACTION PLAN ADDENDUM, GLASS BEACH PROPERTY,
PORT BRAGG, CALIFORNIA; RWQCB CASE NO. 1NMC447**

Dear Mr. Hunt:

SHN Consulting Engineers & Geologists, Inc. (SHN) has prepared this response addressing concerns that the California Regional Water Quality Control Board, North Coast Region (RWQCB) has raised in regards to the site Remedial Action Plan (RAP) prepared by SHN, dated May 2002. This addendum was prepared based on a discussion between the RWQCB and SHN during a phone conversation on July 9, 2002.

Responses to each RWQCB comment are listed below along with the RWQCB comment, which is presented in *italics*.

- *The purpose of the Plan should be clarified. It is widely recognized that the purpose of remedial action at the former dump at Glass Beach is complete removal of wastes, or clean closure. As stated in section 4.0 of the report, this Plan is for "excavation of source areas with off-site disposal."*

The purpose of the remedial action is the removal of sufficient waste from the site to satisfy clean closure requirements. This includes the removal of the major waste cells identified in the RAP along with the waste encountered in boring SB-4, and buried refuse that may be present to the north of the bluff in Area II. In order to effectively remove the existing waste from the site, excavation in each area will be started at locations known to contain refuse. Excavation will continue in all directions until the waste material has been removed.

- *Regional Water Board staff do not require backfilling to be performed for this project. Final re-grading or restoration of the excavations shall be part of any future use plan.*

Although backfilling is not required, SHN recommends that, at a minimum, the sidewalls of the excavations be sloped for safety reasons.

- *The confirmation sample spacing is appropriate.*

No comment required for this item.

- *Cleanup levels in soil of 100 mg/kg for TPH-d and TPH-mo, and 50 mg/kg for lead were proposed. In compliance with Title 27 s21090 of the California Code of Regulations, upon completion of remedial action it will be necessary to demonstrate that any remaining detections do not represent a threat to water quality.*

As part of the confirmation sampling schedule outlined in the RAP, each confirmation sample will be analyzed for total petroleum hydrocarbons as diesel (TPHD), total petroleum hydrocarbons as motor oil (TPHMO) and lead as proposed in the RAP. Additionally, soil samples that contain TPHD, TPHMO or lead at concentrations exceeding the proposed cleanup levels will be tested as follows. Lead samples that exceed the proposed cleanup level will be analyzed using a modified waste extraction test (WET) using de-ionized water as the leaching agent. TPHD and TPHMO samples that exceed the proposed cleanup levels will be tested for leachability using de-ionized water as the leaching agent. The WET/leachability test results will be compared to established water quality goals for each constituent. If the test results exceed water quality goals, then the RWQCB will be consulted to establish an appropriate course of action.

- *A detailed plan for the storage and removal of soil should be submitted for review before work is begun. This plan would not have to be included in the response to these comments.*

The requested plan will be submitted prior to the start of work.

- *It was stated in Section 4.1 of the Plan that the areas would be excavated down to approximately two feet below the refuse zones or to bedrock. There was no elaboration on how the value of two feet was obtained or be used. The depth of the excavation can be based on the results of the investigation, observations at the time of excavation, and the confirmation sampling. A minimum depth of over-excavation is not necessary.*

As suggested, the extent of excavation work will be based on the results of the investigation, observations made at the time of excavation and the results of confirmation sampling.

- *Clarification is necessary on how information in the form of visual inspection would be used to decide where to stop excavation.*

Excavation will be started in areas known to contain refuse, and will continue in all directions until the waste material has been removed. It is expected that there will be a clear distinction between the refuse material and native soil/bedrock. Once all of the obvious refuse material has been removed from a particular excavation area, the native material that underlain the refuse will be visually inspected for staining or other discoloration, and will be field screened using an organic vapor analyzer (OVA) or field test kits. The visual inspection along with the results of the field screening will be used to assess whether or not additional excavation should be conducted. Once a determination to stop excavation has been made, confirmation samples will be collected for submittal to a State of California certified analytical laboratory for chemical analysis.

- *The proposed excavation areas shown in Figures 3 and 4 do not appear to be based upon the extent of refuse found with previous investigations. Debris was noted on the boring logs for borings SB-105B, SB-108B, SB-120, SB-121, SB-123, SB-126, and SB-130. Elevated concentrations of lead and TPH-mo were found in samples from boring SB-4. The proposed excavations do not encompass these borings. Additionally, visual observations of the bluff from the beach indicate that buried refuse extends north from the proposed excavation in Area II. No justification was given in the Plan for exclusion of these areas from excavation.*

In order to effectively remove the existing waste from the site, excavation in each area will be started at locations known to contain refuse. Excavation will continue in all directions until the waste material has been removed. In Area I, borings SB-105B and SB-108B are immediately adjacent to the proposed excavation area, and using the proposed methodology will result in the inclusion of these locations in the excavated area. In Area II, the location of boring SB-4 was not originally included as a proposed excavation area because based on additional site work conducted around SB-4 it appeared that the extent of impacted soil was very limited. However, due to concerns raised by the RWQCB, this area will be included as an excavation area. In regards to comments regarding borings SB-120, SB-123, SB-126 and SB-130, while debris was noted in these borings, TPHD, TPHMO and lead concentrations found in these borings were either very low (well below the proposed cleanup levels for all constituents) or not detected. Due to the uncontrolled nature of the operation of the former dump, it is very likely that there is buried debris scattered throughout the site. However, as shown by laboratory analytical results, the scattered debris found in borings SB-120, SB-123, SB-126 and SB-130 poses no threat to water quality. The proposed methodology of beginning excavation within the known refuse cells and moving out until the waste material has been removed will be utilized.

- *In section 4.1.3 of the Plan, it was stated that the anticipated maximum depth of excavation for Area II would be approximately 7 feet. However, debris was noted at 11 feet below ground surface in boring SB-127, which is within the proposed excavation area. No justification was given for the exclusion of this refuse from the excavation.*

The use of the proposed methodology for excavation will address this concern. However, in order to ensure that all debris at the location of boring location SB-127 is removed, the excavation in this location will be extended to 11 feet below ground surface. An inspection of the extended excavation at this location will be used to assess whether or not additional deep excavation (to 11 feet below ground surface) will be needed.

- *In section 5.3 of the Plan it was stated that "Up to 2,000 cubic yards (yd³) of soil and rubbish may be excavated from the proposed areas." Stopping excavation at a certain volume rather than the limits of refuse or contamination as found through the investigation and as found during the excavation will not satisfy clean closure requirements.*

Sufficient excavation will be conducted to satisfy clean closure requirements at the site.

Mr. Craig Hunt
Remedial Action Plan Addendum, Glass Beach Property
July 17, 2002
Page 4

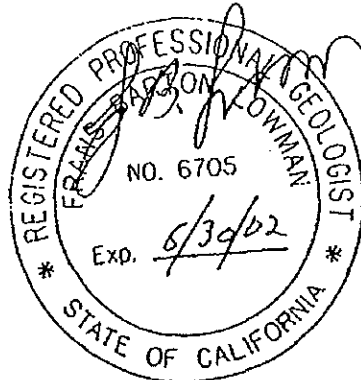
Please do not hesitate to contact me at 441-8855 with any questions you may have.

Sincerely,

**SHN CONSULTING ENGINEERS
& GEOLOGISTS, INC.**



Frans Lowman, R.G.
Senior Project Manager



FBL:dmm

c: William J Blinn Trust, Mr. David Blinn, Trustee
Robert Armitage
Lono Tyson, California Integrated Waste Management Board
Moira McEnespy, California Coastal Conservancy
Roger Sternberg, Mendocino Land Trust
Linda Ruffing, City of Fort Bragg

Attachment 1. RWQCB Correspondence

ATTACHMENT 1

RWQCB CORRESPONDENCE



California Regional Water Quality Control Board

North Coast Region

William R. Massey, Chairman

iston H. Hickox
Secretary for
Environmental
Protection

Internet Address: <http://www.swrcb.ca.gov/rwqcb1/>
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone: 1 (877) 721-9203 (toll free) • Office: (707) 576-2220 • FAX: (707) 523-0135



Gray Davis
Governor

June 24, 2002

Mr. David Blinn
The Blinn Trust
1543 Lewiston Drive
Sunnyvale, CA 94087

REC'D JUN 26 2002

Dear Mr. Blinn:

Subject: Remedial Action Plan

File: Glass Beach Property, West Elm Street, Fort Bragg, CA - Case No. 1NMC447

Thank you for the Remedial Action Plan from SHN Consulting Engineers & Geologists, Inc (the Plan). Regional Water Board staff have reviewed the Plan and have the following comments:

- The purpose of the Plan should be clarified. It is widely recognized that the purpose of remedial action at the former dump at Glass Beach is complete removal of wastes, or clean closure. As stated in section 4.0 of the report, this Plan is for "excavation of source area with off-site disposal".
- Regional Water Board staff do not require backfilling to be performed for this project. Final regrading or restoration of the excavations shall be part of any future use plan.
- The confirmation sample spacing is appropriate.
- Cleanup levels in soil of 100 mg/kg for TPH-d and TPH-mo and 50 mg/kg for lead were proposed. In compliance with Title 27, §21090 of the California Code of Regulations, upon completion of remedial action it will be necessary to demonstrate that any remaining detections do not represent a threat to water quality.
- A detailed plan for the storage and removal of soil should be submitted for review before work is begun. This plan would not have to be included in the response to these comments.
- It was stated in section 4.1 of the Plan that the areas would be excavated down to approximately two feet below the refuse zones or to bedrock. There was no elaboration on how the value of two feet was obtained or would be used. The depth of excavation can be based on the results of the investigation, observations at the time of excavation, and the confirmation sampling. A minimum depth of over-excavation is not necessary.
- Clarification is necessary on how information in the form of visual inspection would be used to decide where to stop excavation.
- The proposed excavation areas shown in Figures 3 and 4 do not appear to be based upon the extent of refuse found with the previous investigations. Debris was noted in the boring logs

California Environmental Protection Agency



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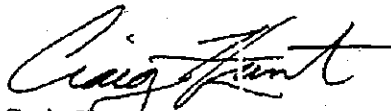
June 24, 2002

for borings SB-105B, SB-108B, SB-120, SB-121, SB-123, SB-126, and SB-130. Elevated concentrations of lead and TPH-mo were found in samples from boring SB-4. The proposed excavations do not encompass these borings. Additionally, visual observations of the bluff from the beach indicate that buried refuse extends north from the proposed excavation in Area II. No justification was given in the Plan for exclusion of these areas from excavation.

- In section 4.1.3 of the Plan, it was stated that the anticipated maximum depth of excavation for Area II would be approximately 7 feet. However, debris was noted at 11 feet below ground surface in boring SB-127, which is within the proposed excavation area. No justification was given for the exclusion of this refuse from the excavation.
- In section 5.3 of the Plan it was stated that "Up to 2,000 cubic yards (yd³) of soil and rubbish may be excavated from the proposed areas." Stopping excavation at a certain volume rather than at the limits of refuse and contamination as found through the investigation and as found during the excavation will not satisfy clean closure requirements.

Please respond to these comments through the submittal of a revised remedial action plan. If you have any questions or wish to discuss this matter, please contact me at (707) 570-3767.

Sincerely,



Craig Hunt
Water Resource Control Engineer

CSH:clh/GlassBeach0206

cc: Robert D. Armitage, Penitenti/Petersen Realty, Inc., 720 S. Main Street, Box 579, Fort Bragg, CA 95437
Frans Lowman, SHN Consulting Engineers & Geologists, Inc., 812 W. Wabash, Eureka, CA 95501-2138
Moirra McEnespy, California State Coastal Conservancy, 1330 Broadway, 11th Floor, Oakland, CA 94612-2530
Roger Sternberg, Mendocino Land Trust, P.O. Box 1094, Mendocino, CA 95460
Lono Tyson, California Integrated Waste Management Board, 1001 "I" Street, P.O. Box 4025, Sacramento, CA 95812
Dave Koppel, Mendocino County Environmental Health Department, 501 Low Gap Road, Room 1326, Ukiah, CA 95482
John P. Morley, Mendocino County Environmental Health Department, 501 Low Gap Road, Room 1326, Ukiah, CA 95482
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Greg Picard, California Department of Parks and Recreation, P.O. Box 440, Mendocino, CA 95460
Mike August, California Department of Parks and Recreation, P.O. Box 942896, Sacramento, 94296-0001
Pat Rogers, California Department of Parks and Recreation, Office of Acquisition and Planning, 1 Capitol Mall, Suite 500, Sacramento, CA 95814-3245

California Environmental Protection Agency

MEMORANDUM (INSPECTION)

Date: 3/19/2001
To: Luis Rivera > File *HR*
From: Craig Hunt
File: GLASS BEACH PROPERTY, FORT BRAGG
CASE NO. 1NMC447

On Tuesday, 3/13/01, I attended a meeting at this site. The other participants were Frans Lowman, SHN; Roger Sternberg, Mendocino Land Trust; Bob Armitage, realtor and representative of the owner; Linda Ruffing, city of Fort Bragg planner; Jason, a new employee in Linda's department; and Teresa Sholars, botanist and professor at the Mendocino Coast Campus of the College of the Redwoods.

The meeting was scheduled for 3:15 p.m. I arrived at the site shortly before 3 p.m. I used the extra time to walk quickly through the site to match up points of the site with aerials of the site I had reviewed. I met with Roger, Bob, and Frans initially. I had thought the point of the meeting was for a botanist to review the site with respect to the proposed drilling work, for the purpose of getting a waiver from having to get a coastal development permit for the work. I thought I was there so as to have the person from the lead regulatory agency present for this inspection. Roger thought the purpose of our meeting was to address my concerns regarding the work plan. I explained to Roger that I thought Frans and I had agreed our inspection would take place at the start of the work. I had brought copies of all the material sent to me regarding the case, so I suggested that the inspection was possible.

Teresa Sholars, Linda Ruffing, and Jason joined us. We first walked to the southwest corner of the site. Frans showed us the location of the proposed borings. Frans explained that the borings would be performed with a Geoprobe rig. He explained there would be no drill cuttings and that the holes would be filled with bentonite. We also discussed where additional borings might be performed depending on the results. Most of the ground cover in this area was ice plant, which is non-native and would likely be removed in any restoration effort. Teresa did not see a problem with the proposed or possible work in this area.

We walked north to the second area of investigation (Area II), which was the northern ocean dump point and a fill area. Teresa expressed that she was mostly concerned with the wetland area around the small creek further north of this area and the rest of the property to the north of the creek. The plants in the investigation areas were not species of concern.


Teresa did say that the property is one of the best spots on the Mendocino Coast for endangered coastal plant species. She explained that the property consists mostly of stabilized sand dunes. The lighter areas in the older aerial photos were more exposed sand dunes. The darker areas to the north of the investigation area in the more recent aerial photo were the wetland areas.

We walked to the area just north of Area II, where I had some concern from the aerial photos and previous observations that there might have been some filling. There were a couple larger pieces of refuse, one of which was a vertical rusted pipe, a few feet long, connected to something covered by ice plant. This was in a depression leading to the beach. Roger looked at the land between the known dump areas and this area. He said that it looked unlikely regular dumping could have occurred at this point because of the terrain. Some hypotheses on how the refuse could have been deposited (e.g. deposition from the ocean during a high tide) were mentioned. I explained that it was not the role of the Water Board to make the determination from the raw observations whether or not filling occurred in this area. I said that they needed to evaluate the area and present the Board with their evaluation and their conclusions. Frans proposed doing a boring in that area to help in making the determination. I concurred.

During the tour we observed a seep and the small creek. I reminded Frans that surface water evaluation and sampling had been part of their work plan. He said he would sample these waters.

We walked further north, past the creek, to a bluff area that Frans had mentioned in one of his letters because of what appeared in an older aerial photo to possibly be a clearing and a path leading to it. This area appeared relatively undisturbed and was very scenic.

We took a more direct path back to the parking area at the end of Elm Street. I told them that my concerns had been addressed. Frans said they would do the drilling in the first half of April.



(K:\Case Material\Glass Beach\Memo Inspection 010319.doc)



California Regional Water Quality Control Board
North Coast Region
William R. Massey, Chairman

Winston H. Hickox
Secretary for
Environmental
Protection

Internet Address: <http://www.swrcb.ca.gov/rwqcb1/>
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone: 1 (877) 721-9203 (toll free) • Office: (707) 576-2220 • FAX: (707) 523-0135



Gray Davis
Governor

August 9, 2002

Mr. David Blinn
The Blinn Trust
1543 Lewiston Drive
Sunnyvale, CA 94087

Dear Mr. Blinn:

Subject: Remedial Action Plan Addendum

File: Glass Beach Property, West Elm Street, Fort Bragg, CA - Case No. INMC447

Thank you for the addendum to the Remedial Action Plan from SHN Consulting Engineers & Geologists, Inc. Regional Water Board staff have reviewed the addendum and concur with the Remedial Action Plan and addendum, with the following comments:

- The soil samples from borings SB-120, SB-123, SB-126, and SB-130 that were submitted for laboratory analyses were from the sand layer under the debris noted in the boring logs and not from the debris or fill.
- Since this project may extend into the wet weather season, the soil handling workplan to be submitted before the start of work should address stormwater management.

A response to these comments does not need to be submitted.

Regional Water Board staff are preparing Waste Discharge Requirements (WDRs) for this project for consideration by the Regional Water Board. A complete Report of Waste Discharge for the project is necessary. The Remedial Action Plan with the addendum constitutes the project description. To complete the ROWD, please submit a completed Form 200 (enclosed) for this project to this office. The classification of this project in regards to the fee schedule for WDRs is Chapter 15 III-b (i.e., Chapter 15 program, category III threat to water quality, category b complexity). The fee for this classification is \$1500 and will be used to pay for staff time preparing the WDRs. Staff time spent preparing this item for consideration by the Regional Water Board will not be charged to your cost-recovery account. Please submit a check for the fee amount with the completed Form 200. The check should be made out to the State Water Resources Control Board.

California Environmental Protection Agency

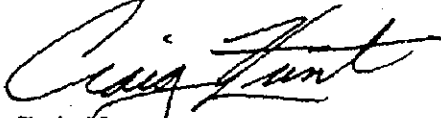
Mr. Blinn

- 2 -

August 9, 2002

I will contact you regarding the details of Form 200. If you have any questions, please contact me at (707) 570-3767.

Sincerely,


Craig Hunt
Water Resource Control Engineer

CSH:clh/GlassBeach0208

Enclosure: Form 200

Cc: Robert D. Armitage, Penitenti/Petersen Realty, Inc., 720 S. Main Street, Box 579, Fort Bragg, CA 95437
Frans Lowman, SHN Consulting Engineers & Geologists, Inc., 812 W. Wabash, Eureka, CA 95501-2138
Moirra McEnespy, California State Coastal Conservancy, 1330 Broadway, 11th Floor, Oakland, CA 94612-2530
Roger Sternberg, Mendocino Land Trust, P.O. Box 1094, Mendocino, CA 95460
Lono Tyson, California Integrated Waste Management Board, 1001 "I" Street, P.O. Box 4025, Sacramento, CA 95812
Dave Koppel, Mendocino County Environmental Health Department, 501 Low Gap Road, Room 1326, Ukiah, CA 95482
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Greg Picard, California Department of Parks and Recreation, P.O. Box 440, Mendocino, CA 95460
Mike August, California Department of Parks and Recreation, P.O. Box 942896, Sacramento, 94296-0001
Pat Rogers, California Department of Parks and Recreation, Office of Acquisition and Planning, 1 Capitol Mall, Suite 500, Sacramento, CA 95814-3245
Connie Jackson, City Manager, City of Fort Bragg, 416 N. Franklin Street, Fort Bragg, CA 95437
Linda Ruffing, Community Development Department, City of Fort Bragg, 416 N. Franklin Street, Fort Bragg, CA 95437
Diana Stuart, Glass Beach Headlands Access Committee, P.O. Box 769, Fort Bragg, CA, 95437

California Environmental Protection Agency



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California Regional Water Quality Control Board

North Coast Region

William R. Massey, Chairman

Winston H. Hickox
Secretary for
Environmental
Protection

Internet Address: <http://www.swrcb.ca.gov/rwqcb1/>
5550 Skyline Boulevard, Suite A, Santa Rosa, California 95403
Phone: 1 (877) 721-9203 (toll free) • Office: (707) 576-2220 • FAX: (707) 523-0135



Gray Davis
Governor

June 24, 2002

Mr. David Blinn
The Blinn Trust
1543 Lewiston Drive
Sunnyvale, CA 94087

Dear Mr. Blinn:

Subject: Remedial Action Plan

File: Glass Beach Property, West Elm Street, Fort Bragg, CA - Case No. 1NMC447

Thank you for the Remedial Action Plan from SHN Consulting Engineers & Geologists, Inc (the Plan). Regional Water Board staff have reviewed the Plan and have the following comments:

- The purpose of the Plan should be clarified. It is widely recognized that the purpose of remedial action at the former dump at Glass Beach is complete removal of wastes, or clean closure. As stated in section 4.0 of the report, this Plan is for "excavation of source areas with off-site disposal".
- Regional Water Board staff do not require backfilling to be performed for this project. Final regrading or restoration of the excavations shall be part of any future use plan.
- The confirmation sample spacing is appropriate.
- Cleanup levels in soil of 100 mg/kg for TPH-d and TPH-mo and 50 mg/kg for lead were proposed. In compliance with Title 27, §21090 of the California Code of Regulations, upon completion of remedial action it will be necessary to demonstrate that any remaining detections do not represent a threat to water quality.
- A detailed plan for the storage and removal of soil should be submitted for review before work is begun. This plan would not have to be included in the response to these comments.
- It was stated in section 4.1 of the Plan that the areas would be excavated down to approximately two feet below the refuse zones or to bedrock. There was no elaboration on how the value of two feet was obtained or would be used. The depth of excavation can be based on the results of the investigation, observations at the time of excavation, and the confirmation sampling. A minimum depth of over-excavation is not necessary.
- Clarification is necessary on how information in the form of visual inspection would be used to decide where to stop excavation.
- The proposed excavation areas shown in Figures 3 and 4 do not appear to be based upon the extent of refuse found with the previous investigations. Debris was noted in the boring logs

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June 24, 2002

for borings SB-105B, SB-108B, SB-120, SB-121, SB-123, SB-126, and SB-130. Elevated concentrations of lead and TPH-mo were found in samples from boring SB-4. The proposed excavations do not encompass these borings. Additionally, visual observations of the bluff from the beach indicate that buried refuse extends north from the proposed excavation in Area II. No justification was given in the Plan for exclusion of these areas from excavation.

- In section 4.1.3 of the Plan, it was stated that the anticipated maximum depth of excavation for Area II would be approximately 7 feet. However, debris was noted at 11 feet below ground surface in boring SB-127, which is within the proposed excavation area. No justification was given for the exclusion of this refuse from the excavation.
- In section 5.3 of the Plan it was stated that "Up to 2,000 cubic yards (yd³) of soil and rubbish may be excavated from the proposed areas." Stopping excavation at a certain volume rather than at the limits of refuse and contamination as found through the investigation and as found during the excavation will not satisfy clean closure requirements.

Please respond to these comments through the submittal of a revised remedial action plan. If you have any questions or wish to discuss this matter, please contact me at (707) 570-3767.

Sincerely,



Craig Hunt
Water Resource Control Engineer

CSH:clh/GlassBeach0206

cc: Robert D. Armitage, Penitenti/Petersen Realty, Inc., 720 S. Main Street, Box 579, Fort Bragg, CA 95437
Frans Lowman, SHN Consulting Engineers & Geologists, Inc., 812 W. Wabash, Eureka, CA 95501-2138
Moira McEnespy, California State Coastal Conservancy, 1330 Broadway, 11th Floor, Oakland, CA 94612-2530
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Mike August, California Department of Parks and Recreation, P.O. Box 942896, Sacramento, 94296-0001
Pat Rogers, California Department of Parks and Recreation, Office of Acquisition and Planning, 1 Capitol Mall, Suite 500, Sacramento, CA 95814-3245

California Environmental Protection Agency



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June 24, 2002

Connie Jackson, City Manager, City of Fort Bragg, 416 N. Franklin Street, Fort Bragg,
CA 95437

Linda Ruffing, Community Development Department, City of Fort Bragg, 416 N.
Franklin Street, Fort Bragg, CA 95437

Diana Stuart, Glass Beach Headlands Access Committee, P.O. Box 769, Fort Bragg, CA,
95437

California Environmental Protection Agency



CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash • Eureka, CA 95501-2138 • 707-441-8855 • Fax 707-441-8877 • shninfo@shn-engr.com

RWQCB
REGION 1

Reference: 099215

FEB - 6 2002

February 5, 2002

<input type="checkbox"/> SAW	<input type="checkbox"/> ECR	<input checked="" type="checkbox"/> JAG
<input type="checkbox"/> RLT	<input checked="" type="checkbox"/> LGR	<input type="checkbox"/> RAD
<input type="checkbox"/> NPO	<input type="checkbox"/> RSG	<input type="checkbox"/> EJL

Mr. Craig Hunt
California Regional Water Quality Control Board, North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

**SUBJECT: RWQCB COMMENT RESPONSE
GLASS BEACH PROPERTY, FORT BRAGG, CALIFORNIA
RWQCB CASE NO. 1NMC447**

Dear Mr. Hunt:

SHN Consulting Engineers & Geologists, Inc. (SHN) has prepared this response addressing comments that the California Regional Water Quality Control Board, North Coast Region (RWQCB) has raised in regards to the site investigation report of findings prepared by SHN, dated May 2001. The RWQCB comments are provided below in *italics*, along with the SHN Response.

The Estimated extents of existing refuse shown on Figures 7 and 8 do not appear to be consistent with the boring logs included in the report. Debris was noted in the following borings that were not included in the estimated extent of refuse: SB-105B, SB-108B, SB-120, SB-121, SB-123, SB-126, and SB-130.

As has been previously reported, the southwest corner of this property was used as a refuse disposal/burn dump area for approximately 17 years, with very little control over the site. Refuse was disposed of by throwing it over the bluff into the ocean, or by burying it in shallow pits. As a result, it is likely that there is refuse mixed in with fill dirt throughout this portion of the property. It was the intent of the investigation to characterize the major refuse dumping areas. For this reason, minor debris found in any particular borings was not automatically identified as a refuse burial area. However, the information provided in all soil borings will be utilized during the implementation of the corrective action plan.

The horizontal extent of contamination in near-surface soil does not appear to be defined.

As stated above, minor debris found in any particular borings was not automatically identified as a refuse burial area.

Borings to the north and east of SB-5 in Area I were not advanced in all the proposed locations. The extent of contamination and refuse does not appear to be identified to the east or locally to the north of SB-5.

Mr. Craig Hunt

RWQCB Comment Response, Glass Beach Property, Case No. INMC447

February 5, 2002

Page 2

The area immediately to the east of boring SB-5 could not be accessed by the drilling equipment used at the site; however, borings SB-111 and SB-114 are located to the east of the area investigated by borings SB-5 and BS-6, and provide useful information on the extent of contamination to the east. The area investigated by borings SB-5 and SB-6 is located between bedrock exposures on the north and south sides. Boring SB-5 is located along the northern bedrock exposure. As in other areas of the site, the extent of contamination to the north of boring SB-5 is defined by the presence of the bedrock exposure.

Please do not hesitate to contact me at 441-8855 with any questions you may have.

Sincerely,

**SHN CONSULTING ENGINEERS
& GEOLOGISTS, INC.**



Frans B. Lowman, R.G.
Senior Project Manager

FBL:med

c: David Blinn
Robert Armitage

Glass Beach Property
Closed Site Inspection Report

10: Craig Hunt
CALIFORNIA INTEGRATED WASTE
MANAGEMENT BOARD

Enforcement Agency:

Page of

FACILITY FILE NUMBER 23-CR-0010	PROGRAM CODE LOCAL = L STATE = S L	INSPECTION DATE MM DD YY 12 07 01	TIME IN TIME OUT	INSPECTION TIME 1
FACILITY NAME Glass Beach / Fort Bragg BD			RECEIVED BY (OPERATOR)	
FACILITY LOCATION End of Elm street FB			OWNER	
INSPECTOR David Koppel	INSPECTOR SIGNATURE David Koppel		ALSO PRESENT	

THE ABOVE FACILITY WAS INSPECTED FOR COMPLIANCE WITH APPLICABLE SECTIONS OF DIVISION 30 OF THE PUBLIC RESOURCES CODE (PRC) and TITLE 27 CALIFORNIA CODE OF REGULATIONS (CCR).

THE STANDARDS BELOW ARE CONSIDERED IN COMPLIANCE UNLESS OTHERWISE MARKED WITH ONE OF THE FOLLOWING: V = VIOLATION A = AREA OF CONCERN NA = NOT APPLICABLE

SITES NOT SUBJECT TO ARTICLE 2 STANDARDS

	V	A	NA
20530 - SITE SECURITY			
20650 - GRADING OF FILL SURFACES			
20750 - SITE MAINTENANCE			X
20790 - LEACHATE CONTROL			
20820 - DRAINAGE / EROSION CONTROL			X
20830 - LITTER CONTROL			
20919 - GAS CONTROL			
21190(c) - POSTCLOSURE LAND USE			
OTHER			

COMMENTS (USE SMS-43 FOR ADDITIONAL SPACE)

20820 Erosion Control + 20750 site maintenance

Erosion is cutting into the old burn dump exposing metals and glass. New waste exposures are occurring.

North Coast Regional Water Quality Control Board lead agency in site mitigation

copy sent to Craig Hunt at NCRWQCB

SPACE FOR ADDITIONAL COMMENTS, DIAGRAMS, OR NOTES.

RWQCB
REGION 1

DEC 11 2001

☐ SAW ☐ ECR ☒ JMG
☐ RLT ☒ LGR ☐ KAD
☐ NPO ☐ RSG ☐ EJI
 /CSH

Glass Beach Property



RWQCB
REGION 1

OCT 22 2001

<input type="checkbox"/> SAW	<input type="checkbox"/> CRJ	<input checked="" type="checkbox"/> JMC
<input type="checkbox"/> RLT	<input checked="" type="checkbox"/> LGR	<input checked="" type="checkbox"/> KAD
<input type="checkbox"/> FCR	<input type="checkbox"/> RSG	<input checked="" type="checkbox"/> HWT

October 19, 2001

Bob Armitage
Penitenti/Petersen Realty, Inc.
720 S. Main, Box 579
Fort Bragg, CA 95437

Pat Rogers
State Dept. of Parks and Recreation
Office of Acquisition and Real Property Services
One Capitol Mall, Suite 500
Sacramento, CA 95814

Subject: Caltrans' rules governing the Glass Beach acquisition, Mendocino County

Dear Mr. Armitage and Mr. Rogers:

As you are aware, the Coastal Conservancy applied for and received a Caltrans TEA Program grant for acquisition of Glass Beach.

I have explained to Caltrans the Glass Beach site's former use, the Regional Water Quality Control Board's ("RWQCB's") involvement, the need for site remediation, and the landowner's desire to get an offer in writing. The TEA Program nevertheless has strict rules for property acquisition projects that govern the time at which negotiations can commence, written offers can be made, and purchase agreements drafted. Hence, Caltrans has developed the following sequence of events for the Glass Beach acquisition to which we must all adhere (see enclosed letter from Caltrans). Most notably:

1. The landowner must submit a remediation plan to the RWQCB;
2. The RWQCB must approve the remediation plan; and
3. I must submit the RWQCB-approved remediation plan to Caltrans.

At this point, the Federal Highway Administration ("FHWA") must agree to sign the NEPA environmental document (e.g., "categorical exclusion"). (Note that the FHWA normally does not grant NEPA clearance until the RWQCB has signed-off on a site's cleanliness. We are thus grateful that Caltrans has agreed for this project to champion the FHWA's issuing NEPA clearance prior to site remediation.).

1330 Broadway, 11th Floor
Oakland, California 94612-2530
510-286-1015 Fax: 510-286-0470

Mr. Bob Armitage and Mr. Pat Rogers
Re: Caltrans' requirements for the Glass Beach Acquisition
October 19, 2001
Page 2 of 2

If the FHWA does not sign the NEPA document, no further negotiation/offers/agreements can be made until the site has been remediated to the satisfaction of the RWQCB. If the FHWA does sign the NEPA document, Caltrans can issue authorization to proceed with Right-of-Way, and we can proceed with the following activities:

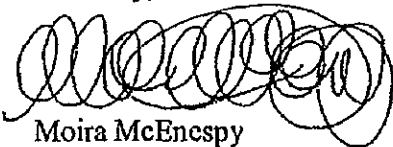
4. State Parks can extend a written offer, and the landowner and State Parks can draft a purchase agreement;
5. The RWQCB must sign-off that the site has been remediated to its satisfaction (upon notification, the FHWA can then obligate the funds for expenditure); and
6. Escrow can proceed, and the Conservancy can invoice Caltrans for the funds to be placed in the escrow account.

Please note that Caltrans has stated that if this sequence is violated, all federal TEA money on this project could be jeopardized.

Finally, as you know, Caltrans expected that this project would have been completed by now, and the funds spent; hence we must continue to make a good faith effort toward completing the acquisition lest the California Transportation Commission ("CTC") demand that the funds be returned. To this end, we would all appreciate your doing everything possible to expedite submittal of the remediation plan to the RWQCB.

Thank you for your continued work on the Glass Beach project. As the TEA applicant, I need to continue to communicate directly with Caltrans; thus, if you have any questions about this sequence or Caltrans' process, please contact me directly and I will communicate with Caltrans.

Cordially,



Moira McEncspy
Project Manager

cc: Ken Karlstad/Roger Sternberg, MLT
Craig Hunt, RWQCB
Greg Picard, DPR
Connie Jackson, City of Fort Bragg

DEPARTMENT OF TRANSPORTATION

DISTRICT 1
1656 UNION STREET
P. O. BOX 3700
EUREKA, CA 95502-3700
PHONE (707) 441-3977
FAX (707) 441-5869

RWQCB
REGION 1



OCT 22 2001

<input type="checkbox"/> SAW	<input type="checkbox"/> CRJ	<input type="checkbox"/>
<input type="checkbox"/> RLT	<input type="checkbox"/> LGR	<input type="checkbox"/> KAD
<input type="checkbox"/> FCR	<input type="checkbox"/> RSG	<input type="checkbox"/>

October 16, 2001

Moira McEnespy
Ca. Coastal Conservancy
1330 Broadway, Suite 1100
Oakland, CA 94612

01-MEN-0-CACC
STPLEC-6078 (005)
Glass Beach

Dear Ms. McEnespy:

This letter is to document my telephone message of October 15, 2001 concerning the California Coastal Conservancy's Land Acquisition project at Glass Beach. After discussing this project with our right-of-way staff, it was determined that the Conservancy has not committed an irrevocable error that would risk the project funding. Included in this letter is a sequence of events to which the Conservancy must adhere. If the Conservancy violates this sequence, all Federal TEA money on this project could be jeopardized.

- Immediate review of the subject property appraisal by Caltrans Right-of-Way staff.
- Completion and acceptance of the remediation plan by the Regional Water Quality Board (RWQB)
- Submission of all supporting data for the NEPA document to Caltrans Environmental branch.
- Acceptance and signature of the NEPA document by Caltrans environmental staff. Our office will then forward both the plan and NEPA document to FHWA for review and approval.
- FHWA must agree to sign the NEPA document at this point in the process. If FHWA does not sign the NEPA document, no further action can proceed until the property has been cleared by the RWQB.
- Authorization to proceed with R/W and accompanying documentation forwarded by the Conservancy.
- Purchase agreement or Memo of Understanding (MOU) created for the subject property between the landowner and the Conservancy dependent on remediation resolution.
- Property clearance by RWQB and notification of acceptance forwarded to Caltrans.
- R/W is now obligated by FHWA for expenditures. Escrow can proceed.
- Conservancy can then invoice for purchase price and close out this project.

This plan is contingent on FHWA approval of the NEPA document and due to recent FHWA positions on projects, approval is doubtful until the remediation plan has been implemented. However, our office will champion the Conservancy's position to FHWA on this project once we have received supporting material.

If you have any questions/concerns or need any further assistance please call me at the above number.

Sincerely,

DARRON HILL
Local Assistance Engineer (South)

RECEIVED

OCT 19 2001

COASTAL CONSERVANCY
OAKLAND, CALIF.



California Regional Water Quality Control Board

North Coast Region

William R. Massey, Chairman

Winston H. Hickox
Secretary for
Environmental
Protection

Internet Address: <http://www.swrcb.ca.gov/~rwqcb1/>
5550 Skyline Boulevard, Suite A, Santa Rosa, California 95403
Phone: 1 (877) 721-9203 (toll free) • Office: (707) 576-2220 • FAX: (707) 523-0135



Gray Davis
Governor

September 21, 2001

Mr. David Blinn
1543 Lewiston Drive
Sunnyvale, CA 94087

Dear Mr. Blinn:

Subject: Report of Findings and Request for Corrective Action Plan

File: Glass Beach Property, West Elm St., Fort Bragg, CA
Case No. 1NMC447

Regional Water Board staff have reviewed the *Additional Site Investigation Report of Findings, Glass Beach Property* submitted by SHN on June 22, 2001. A discharge of waste to land was characterized. Non-RCRA hazardous waste concentrations of total and leachable lead were detected. The results of the investigation indicate that the waste presents a threat to water quality. Chapter 15 of Division 3, Title 23 and Subdivision 1 of Division 2, Title 27 of the California Code of Regulations (collectively referred to as Chapter 15 regulations) are applicable.

You have three general options for site remediation to comply with Chapter 15 regulations: containment and capping of the waste according to the specifications of the regulations, an engineered alternative, and clean-closure through removal of the waste from the site to an appropriate facility. Pursuant to California Water Code Section 13267(b), we request that you submit to this office a corrective action plan describing a selected alternative for remedial activities at the site.

Regional Water Board staff have the following additional comments on the report:

- The estimated extents of existing refuse shown in Figures 7 and 8 do not appear to be consistent with the boring logs included in the report. Debris was noted in the following borings that were not included in the estimated extent of refuse: SB-105B, SB-108B, SB-120, SB-121, SB-123, SB-126, and SB-130.
- The horizontal extent of contamination in near-surface soil does not appear to be defined.
- Borings to the north and east of SB-5 in Area I were not advanced in all the proposed locations. The extent of contamination and refuse does not appear to be defined to the east or locally to the north of SB-5.

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September 21, 2001

We request that these comments be addressed through the corrective action plan.

If you have any questions, please contact me at (707) 570-3767.

Sincerely,



Craig Hunt
Water Resource Control Engineer

CSII:dc\Glass Beach 0108.doc

cc: Mr. Robert D. Armitage, Penitenti/Petersen Realty, Inc., 720 S. Main Street, Box 579,
Fort Bragg, CA 95437

Mr. Roger Sternberg, Mendocino Land Trust, P.O. Box 1094, Mendocino, CA 95460

Mr. Frans Lowman, SHN Consulting Engineers & Geologists, Inc., 812 W. Wabash,
Eureka, CA 95501-2138

Ms. Moira McEnespy, California State Coastal Conservancy, 1330 Broadway, 11th Floor,
Oakland, CA 94612-2530

Mr. Dave Goble, Public Works Department, 416 N. Franklin Street, Fort Bragg, CA 95437

Mr. Dave Koppel, Mendocino County Environmental Health Department,
501 Low Gap Road, Room 1326, Ukiah, CA 95482

Mr. John P. Morley, Mendocino County Environmental Health Department,
501 Low Gap Road, Room 1326, Ukiah, CA 95482

Mr. Ron Munson, California Department of Parks and Recreation, P.O. Box 440,
Mendocino, CA 95460

Mr. Mike August, California Department of Parks and Recreation, P.O. Box 942896,
Sacramento, 94296-0001

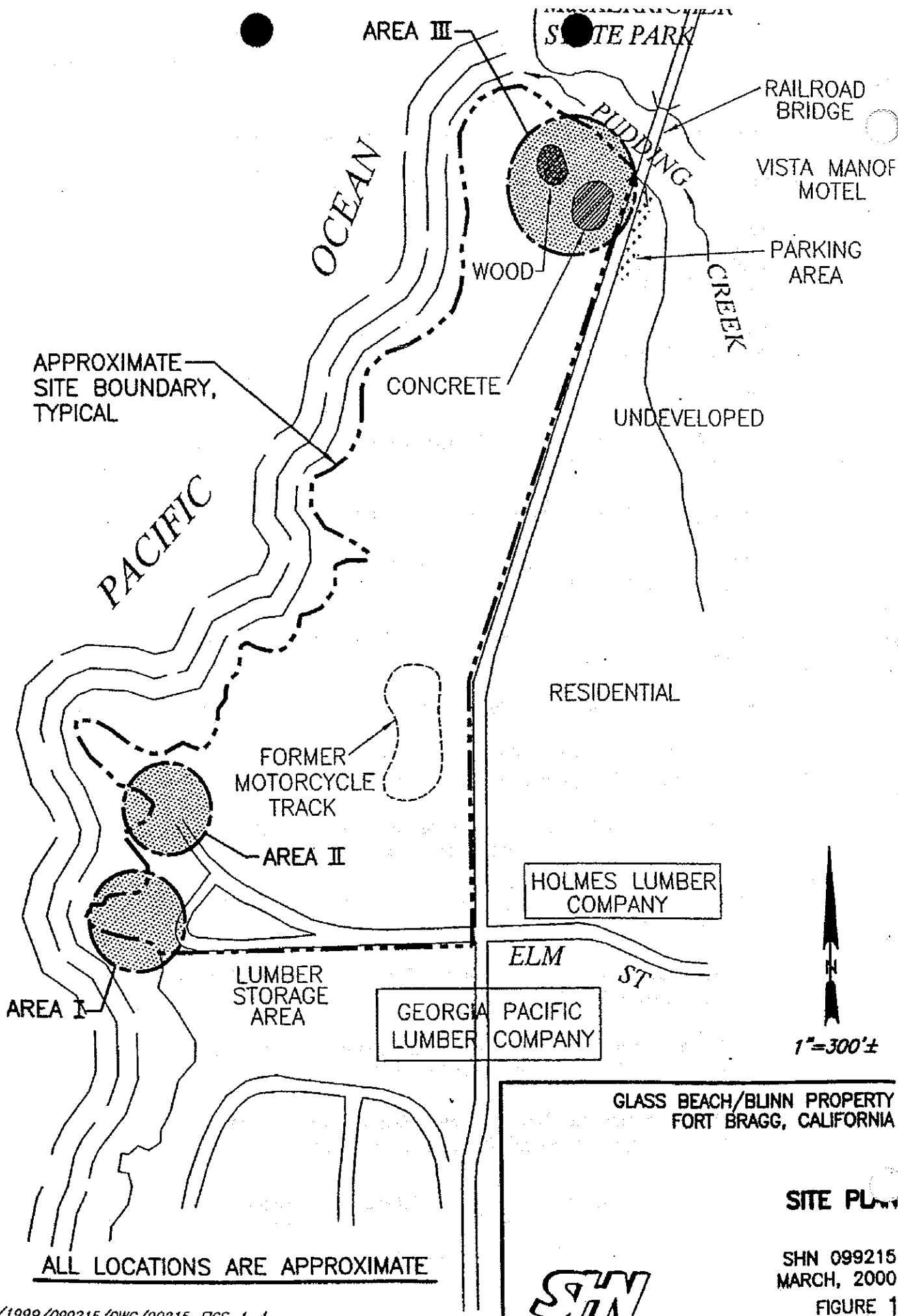
Ms. Linda Ruffing, Community Development Department, City of Fort Bragg,
416 N. Franklin Street, Fort Bragg, CA 95437

Mr. Wes Minderman, California Integrated Waste Management Board,
1001 I Street, P.O. Box 4025, Sacramento, CA 95812

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3.3 Soil and Water Disposal

The volume of soil generated during hand auger boring activities was negligible. Soil removed from each boring was used to backfill the top two feet of each boring as requested by the Mendocino County Health Department. Any remaining soil was spread on site.

Water used in the decontamination of tools and all well purge water was temporarily contained in a DOT approved 17 E/H, 55 gallon drum. Less than 10 gallons of water was generated during this investigation was transported to the SHN temporary purge water storage facility for storage, testing and proper disposal.

3.4 Laboratory Analysis

Soil samples were analyzed for TPHD, TPHMO, polychlorinated biphenyls (PCBs), pesticides, semi-volatile organic compounds (SVOCs), and the metals arsenic, cadmium, chromium, nickel, lead, and zinc using the following methods:

- | | |
|----------------------|-----------------------------|
| • TPHD/TPHMO | EPA Method No. 3510/GC-FID. |
| • PCBs | EPA Method No. 8080. |
| • Pesticides | EPA Method No. 8080. |
| • SVOCs | EPA Method No. 8270 |
| • Cd, Cr, Ni, Pb, Zn | EPA Method No. 6010. |

Each soil gas sample was analyzed for methane in accordance with Method No. ASTM D-1946.

4.0 RESULTS OF THE INVESTIGATION

4.1 Soil

Soils encountered in each area consisted of sandy silt/silty sand, with fine to medium grained sand present for the entire depth of each boring. Degraded rubbish was encountered in selected borings in areas I and II. Groundwater was not encountered in any of the borings.

4.1.1 Organic Chemistry Analytical Results

As part of this investigation, each soil sample, including a surface soil sample collected from the beach area, was analyzed for TPHD and TPHMO. Selected soil samples were analyzed for PCBs, pesticides, and SVOCs.

A TPHD concentration of 370 milligram per kilogram (mg/kg) was detected in the soil sample collected from sampling point SB-8 (Area I) at a depth of 1.5 feet BGS. TPHD was not detected in any other soil samples submitted for laboratory analysis.

TPHMO was detected in each soil sample collected from Area I at concentrations ranging from 130 mg/kg in boring SB-3, to 490 mg/kg in boring SB-4. TPHMO (79 mg/kg) was also detected in the soil sample collected from sampling point SB-8 at a depth of 0.5 feet BGS. TPHMO was not detected in any other soil samples submitted for laboratory analysis, including any soil samples collected from Area III.

PCBs, pesticides, and SVOCs were not detected in any soil samples submitted for laboratory analysis.

TPHD and TPHMO analytical results for soil are summarized in Table 1. PCB, pesticide, and SVOC analytical results are summarized in Table 2. Laboratory analytical reports are presented in Appendix A.

4.1.2 Inorganic Chemistry Analytical Results

Each soil sample was analyzed for the metals arsenic, cadmium, chromium, nickel, lead, and zinc.

Arsenic was detected in soil samples SB-1 at 1.5 feet BGS and SB-6 at 1.5 feet BGS at concentrations of 11 mg/kg and 16 mg/kg, respectively.

Cadmium was detected in 10 soil samples at concentrations ranging from 1.1 mg/kg to 5.7 mg/kg.

Chromium was detected in all soil samples submitted for laboratory analysis at concentrations ranging from 13 mg/kg in soil sample SB-3 at 1.5 feet BGS, to 98 mg/kg in soil sample SB-8 at 1.5 feet BGS.

Lead was detected in all soil samples submitted for laboratory analysis at concentrations ranging from 2.9 mg/kg in soil sample SB-7 at 0.5 feet BGS, to 918 mg/kg in soil sample SB-8 at 1.5 feet BGS.

Nickel was detected in all soil samples submitted for laboratory analysis at concentrations ranging from 14 mg/kg in soil samples SB-3 at 1.5 feet and SB-7 at 0.5 feet BGS, to 131 mg/kg in soil sample SB-6 at 1.5 feet BGS.

Zinc was detected in all soil samples submitted for laboratory analysis at concentrations ranging from 42 mg/kg in soil sample SB-3 at 1.5 feet BGS, to 3,270 mg/kg in soil sample SB-1 at 1.5 feet BGS.

Inorganic chemistry soil analytical results are summarized in Table 1. Laboratory analytical reports are presented in Appendix A.

4.1.3 Soil Gas Analysis

Three soil gas samples were collected from the site and analyzed for methane gas. Methane was not detected in any soil gas samples analyzed. Methane analytical results are presented in Table 3. Laboratory analytical reports are presented in Appendix A.

4.2 Risk Based Corrective Action Analysis

A risk-based analysis was conducted utilizing a software program called RBCA (Risk-Based Corrective Action) which implements a Tier 2 RBCA evaluation following guidelines described in ASTM E-1739 "Standard Guide for Risk-Based Corrective Action applied at Petroleum Release Sites" (GSI, 1995). Field data collected during site investigation activities were used as part of the RBCA analysis. The RBCA Analysis was conducted in order to assess the need for additional site remediation activities.

The goal of this analysis was to assess if concentrations of various constituents present at the site could be left in place while minimizing the impact to potential human or ecological receptors. RBCA utilizes an extensive chemical constituent database that is included as part of the software program. This database contains chemical, physical, and health-based characteristics of each constituent included in the database. This information, along with user input data, is used to calculate a site specific target level (SSTL) concentration, which if left in place, would result in contaminant concentrations at the potential receptor that would be at or below accepted health based target goals. RBCA also calculates a total pathway carcinogenic risk and hazard index based on accepted target carcinogenic risk values for Class A, B, and C carcinogens, and toxicity data for each contaminant of concern (COC).

Soil Quality Data

RBCA requires component specific analytical data for site analysis. Soil data for the metals arsenic, cadmium, chromium, nickel, and zinc were used to assess the threat of exposure from metals impacted soil to human health. These analytes contain the type of information required for RBCA. There are no ASTM standards for lead, therefore, lead could not be assessed using RBCA, which utilizes ASTM guidelines. The risk associated with lead is discussed in Section 4.3. RBCA requires component specific analysis, analysis of individual constituents which make up a compound. The general compounds TPHD and TPHMO are made up of hundreds of individual constituents, some of which would be needed for RBCA to properly assess these compounds. Therefore TPHD and TPHMO were not assessed using the RBCA program.

TABLE 1
PETROLEUM HYDROCARBON AND METALS ANALYTICAL RESULTS IN SOIL
GLASS BEACH, FORT BRAGG, CALIFORNIA
(in ug/g)

SAMPLE LOCATION	SAMPLE DATE	SAMPLE DEPTH ³	TPHD ¹	TPHMO ²	ARSENIC	CADMIUM	CHROMIUM	LEAD	NICKEL	ZINC
SB1@0.5	1/31/00	0.5	<1.0 ⁴	160	<10	1.1	22	396	33	1,020
SB1@1.5	1/31/00	1.5	<1.0	270	11	2.1	16	344	29	3,270
SB2@0.5	1/31/00	0.5	<1.0	470	<10	1.3	24	319	34	1,150
SB2@1.5	1/31/00	1.5	<1.0	350	<10	1.8	24	609	47	1,830
SB3@0.5	1/31/00	0.5	<1.0	430	<10	<0.5	14	91	18	799
SB3@1.5	1/31/00	1.5	<1.0	130	<10	<0.5	13	3.8	14	42
SB4@0.5	1/31/00	0.5	<1.0	490	<10	<0.5	25	247	40	166
SB4@1.5	1/31/00	1.5	<1.0	410	<10	1.4	24	254	22	660
SB5@0.5	1/31/00	0.5	<1.0	<50	<10	2.0	20	532	34	1060
SB5@1.5	1/31/00	1.5	<1.0	<50	<10	<0.5	16	27	17	73
SB6@0.5	1/31/00	0.5	<1.0	<50	<10	1.3	17	138	36	730
SB6@1.5	1/31/00	1.5	<1.0	<50	16	1.4	37	378	131	999
SB7@0.5	1/31/00	0.5	<1.0	<50	<10	<0.5	16	2.9	14	65
SB7@1.5	1/31/00	1.5	<1.0	<50	<10	<0.5	15	3.6	15	87
SB8@0.5	1/31/00	0.5	<1.0	79	<10	5.7	23	302	29	1,150
SB8@1.5	1/31/00	1.5	370	<50	<10	1.8	98	918	42	111
SB9@0.5	2/1/00	0.5	<1.0	<50	<10	<0.5	38	5.7	25	55
SB9@1.5	2/1/00	1.5	<1.0	<50	<10	<0.5	40	6.0	25	60

TABLE 1 (Continued) PETROLEUM HYDROCARBON AND METALS ANALYTICAL RESULTS IN SOIL GLASS BEACH, FORT BRAGG, CALIFORNIA (in ug/g)										
SAMPLE LOCATION	SAMPLE DATE	SAMPLE DEPTH ³	TPHD ¹	TPHMO ²	ARSENIC	CADMIUM	CHROMIUM	LEAD	NICKEL	ZINC
SB10@0.5	2/1/00	0.5	<1.0	<50	<10	<0.5	39	4.6	25	43
SB10@1.5	2/1/00	1.5	<1.0	<50	<10	<0.5	40	7.0	30	64
SB11@0.5	2/1/00	0.5	<1.0	<50	<10	<0.5	44	6.4	27	60
SB11@1.5	2/1/00	1.5	<1.0	<50	<10	<0.5	52	6.9	38	62
SB12@0.5	2/1/00	0.5	<1.0	<50	<10	<0.5	38	8.5	30	53
SB12@1.5	2/1/00	1.5	<1.0	<50	<10	<0.5	48	7.4	35	71
Beach	1/31/00	surface	<1.0	<50	NA ⁵	NA	NA	NA	NA	NA

1. TPHD - Total petroleum hydrocarbons as diesel, analyzed in accordance with EPA Method No. 3550.

2. TPHMO - Total petroleum hydrocarbons as motor oil analyzed in accordance with EPA Method No. 3550.

3. Sample depth, in feet below ground surface.

4. "<" denotes less than.

5. NA - Not analyzed.

TABLE 2
ORGANIC COMPOUND ANALYTICAL RESULTS IN SOIL
GLASS BEACH, FORT BRAGG, CALIFORNIA
(in ug/g)

SAMPLE LOCATION	SAMPLE DATE	SAMPLE DEPTH ¹	PESTICIDES ²	PCBS ³	SVOCs ⁴
SB1@1.5	1/31/00	1.5	ND ⁵	ND	ND
SB8@1.5	1/31/00	1.5	ND	ND	ND
SB12@1.5	2/1/00	1.5	ND	ND	ND

1. Sample depth, in feet below ground surface.
2. Organochlorine pesticides analyzed in general accordance with EPA Method No. 8080. See laboratory reports for a complete list of organochlorine pesticides.
3. PCBs analyzed in general accordance with EPA Method No. 8080. See laboratory reports for a complete list of PCBs.
4. SVOCs - Semivolatile organic compounds analyzed in general accordance with EPA Method No. 8270. See laboratory reports for a complete list of SVOCs.
5. ND - Not detected. See laboratory data sheets for detection limits.

TABLE 3
METHANE ANALYTICAL RESULTS IN SOIL GAS
GLASS BEACH, FORT BRAGG, CALIFORNIA

SAMPLE LOCATION	SAMPLE DATE	SAMPLE DEPTH ¹	METHANE ²
SG-1	2/1/00	2.5	<0.0020 ³
SG-2	2/1/00	2.5	<0.0020
SG-3	2/1/00	2.5	<0.0020

1. Sample depth, in feet below ground surface.
2. Methane analyzed in general accordance with EPA Method No. 8080. Concentration in percent volume.
3. "<" denotes "less than".

Using soil analytical results of samples collected at the site, the following constituent concentrations were assumed to be in place:

Soil

Arsenic - 16 ug/g

Cadmium - 5.7 ug/g

Chromium - 98 ug/g

Lead - 918 ug/g

Nickel - 131 ug/g

Zinc - 3,270 ug/g

RBCA Setup and Assumptions

A phase I site assessment indicated that past site uses could result in the impact of subsurface soils. During the initial setup of the RBCA analysis, potential "pathways" or methods of transport from a source area to a potential receptor are assessed. In this evaluation, surface and subsurface soil, and groundwater pathways were considered, with air pathways not being considered. Other assumptions are discussed in the remainder of this section.

Risk Factors

A Class A and B carcinogen target risk value of 1×10^{-6} and a Class C carcinogen target risk value of 1×10^{-5} along with a target hazard index of 1 were used in this evaluation.

Potential Receptors

The only potential receptor is groundwater which may flow beneath the site towards the Pacific Ocean.

4.2.1 RBCA Analysis Results

Results from this analysis indicate that there is a potential threat to an on-site receptor as a result of metals-impacted soil present at the site.

The Total Pathway Carcinogenic Risk (2.8×10^{-3}) exceeded the set limit of 1.6×10^{-6} , and the Total Pathway Hazard Index (2.8×10^1) exceeded the set limit of 1.0 for potential on-site receptors exposed to groundwater.

additional investigation for zinc may be needed. Zinc concentrations found in soil samples collected from area III are at concentrations that are up to two orders of magnitude lower than concentrations found in Areas I and II, indicate that the zinc found in Area III may be naturally occurring.

The PRGs for 1999 are presented in Appendix C.

4.4 Hazardous Waste Assessment

Lead and zinc were found in several soil samples at concentrations that may be sufficiently elevated for the material to be considered a hazardous waste. Two criteria used to assess whether or not the contaminants found in soil samples collected are considered hazardous are: 1) the concentration found in soil, and 2) the potential for the contaminant to leach out of the soil, and subsequently impact groundwater. Analysis used to assess these conditions are total threshold limit concentration (TTLC) and soluble threshold limit concentration (STLC) analysis.

TTLC is an analysis of the soil to assess soil concentrations. STLC is a procedure where a soil sample undergoes a leachability test. The leachate is then analyzed to find out how much of the contaminant leached out of the soil sample into the leachate liquid. STLC thresholds have been set for lead and zinc at 5 milligrams per liter (mg/l), and 250 mg/l, respectively. If the TTLC results are 10 times higher than the STLC threshold, then the STLC analysis is conducted. The STLC threshold for lead was exceeded in Areas I and II. The STLC threshold for zinc was exceeded in one soil sample collected from Area II. These results indicate that lead and zinc concentrations may have to be treated as hazardous waste.

5.0 CONCLUSIONS AND RECOMMENDATIONS

A Phase I site assessment reported that three areas of the site had, at various time, been used for refuse disposal, which may have resulted in an impact to subsurface soils. Information collected during this investigation confirms that refuse was buried in Areas I and II, and that metals are the contaminant of primary concern. Petroleum hydrocarbon contamination was also found in Areas I and II at the site. No subsurface contamination was found in Area III. The concrete and wood rubble found in Area III in not considered a contaminant source that could impact soil or groundwater.

Elevated lead and zinc concentrations were found in Areas I and II, which may require additional investigation and remediation. Both lead and zinc may be present at concentrations that exceed hazardous waste levels. Concentrations of the metals arsenic, cadmium, chromium and nickel were found in soil samples collected throughout the site. However, concentrations for these metals were below their respective PRGs, indicating that additional investigation for these metals is not required.

The RBCA analysis indicates that the impact of arsenic, cadmium, chromium, nickel, and zinc present in subsurface soils leaching into groundwater beneath the site is minimal. Projected arsenic, cadmium, chromium, nickel, and zinc concentrations which may leach into groundwater

beneath the site were below their respective maximum contaminant levels (MCLs) for drinking water as set by the State of California.

TPHD and TPHMO concentrations found in site soils indicate the presence of petroleum hydrocarbons which requires additional site investigation. Additional work is needed to assess the vertical and horizontal extent of the petroleum hydrocarbon contamination in soil, and to assess the impact of petroleum hydrocarbons on groundwater.

SHN recommends that additional site investigation be conducted in Areas I and II to assess the extent of petroleum hydrocarbon, lead, and zinc contamination in these two areas. The extent of contamination of these constituents need to be adequately assessed in order to develop a remedial action plan for the site. Current regulations may require that the refuse currently in place in Areas I and II be removed and properly disposed of. Proper assessment of each area will ensure that only needed removal is conducted. Due to the presence of these contaminants, groundwater conditions need to be investigated to assess groundwater quality.

Prior to the conduct of any additional site investigation, discussions should be conducted with the California Regional Water Quality Control Board, North Coast Region (RWQCB), in order to gain an understanding of their concerns. A work plan will then be prepared for submittal to the RWQCB for their review and approval.

Additional site assessment may include the installation and sampling of soil borings in both areas to assess the horizontal and vertical extent of the buried waste, and petroleum hydrocarbon, lead, and zinc contamination in soil.

Selected soil borings may then be used for the installation of temporary well points to assess groundwater conditions beneath the site. Once the extent of subsurface waste and impacted soil has been defined, a remedial action plan can be prepared for the site.

It is recommended that soil and groundwater samples be analyzed for lead, zinc, TPHD, TPHMO, total petroleum hydrocarbons as gasoline (TPHG), benzene, toluene, ethylbenzene and total xylenes (BTEX) and PNAs. TPHG and BTEX analysis needs to be included in the petroleum hydrocarbon suite to ensure that these components are not present. Historical disposal practices at the site may have included these components, either as refuse, or as an ignition fluid. PNAs are individual constituents of TPHD and TPHMO that can be used to conduct a RBCA analysis on TPHD and TPHMO.

Analytical results of soil samples collected from Area III indicate that additional investigation in this area is not necessary. However, the removal of the concrete and wood rubble currently stockpiled in this area could be removed as a safety precaution.

6.0 ESTIMATED COSTS

The estimated cost to conduct the additional recommended site assessment is \$15,000. This includes drilling and laboratory subcontract services. The estimated cost to dispose of the concrete and wood debris present in Area III is \$6,000. Prior to the disposal of the concrete debris, an inquiry should be made with local interested parties that may be able to use the concrete as rip-rap. This may be a cost effective alternative for disposal of this material. A cost estimate for the excavation and disposal of waste material and lead-impacted soil cannot be estimated at this time. The information collected during the additional site investigation would be used to assess the total volume to be excavated for disposal.

These are estimated costs provided to MLT as a guideline to estimate future costs related to the cleanup of the site.

REFERENCES

Dannat and Associates, letter to the California State Coastal Conservancy, dated March 1, 1999.

Groundwater Services Inc. Tier 2 Guidance Manual for Risk-Based Corrective Action, 1995.

United State Environmental Protection Agency, Region 9 Preliminary Remediation Goals, October 1, 1999.

The Total Pathway Carcinogenic Risk was below the set limit of $1.6E-6$, and the Total Pathway Hazard Index was below the set limit of 1.0 for potential on-site receptors exposed to subsurface and surface soils.

Output from the RBCA analysis are presented in Appendix B.

4.3 Preliminary Remediation Goals Analysis

Preliminary remediation goals (PRGs) are risk-based tools provided by the U.S. Environmental Protection Agency Region 9 (USEPA) for evaluating and cleaning up contaminated sites. Chemical concentrations above these levels would not automatically designate a site as "dirty" or trigger a response action. However, exceeding a PRG suggests that further evaluation of the potential risks that may be posed by site contaminants is appropriate (USEPA, 1999).

The PRG for lead in soil in a residential area is 400 ug/g. Lead concentrations exceeding 400 ug/g were found in soil samples collected from Areas I and II, with the highest lead concentration being found in Area I at a concentration of 918 ug/g. These concentrations indicate that additional investigation may be required to assess the need for site remediation.

The PRG for arsenic in soil in a residential area is 22 ug/g. Arsenic was only found in two soil samples submitted for laboratory analysis, each at concentrations less than the PRG for arsenic. These results indicate that the need for further evaluation for arsenic is not warranted.

The PRG for cadmium in soil in a residential area is 37 ug/g. Cadmium was found in several soil samples collected throughout the site at concentrations less than the PRG for cadmium. The concentrations found at the site indicate that the cadmium present in subsurface soils may be naturally occurring, and the need for further evaluation for cadmium is not warranted.

The PRG for chromium in soil in a residential area is 210 ug/g. Chromium was found in each soil sample collected at concentrations less than the PRG for chromium. The concentrations found at the site indicate that the chromium present in subsurface soils may be naturally occurring, and the need for further evaluation for chromium is not warranted.

The PRG for nickel in soil in a residential area is 1,600 ug/g. Nickel was found in each soil sample collected at concentrations less than the PRG for nickel. The concentrations found at the site indicate that the nickel present in subsurface soils may be naturally occurring, and the need for further evaluation for nickel is not warranted.

The PRG for zinc in soil in a residential area is 23,000 ug/g. Zinc was found in each soil sample collected at concentrations less than the PRG for zinc. The concentrations found in selected soil samples collected from Areas I and II indicate that the zinc present may be the result of past refuse disposal practices at the site. The concentrations found in these areas indicate that

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R W Q C B
REGION 1

COUNTY OF MENDOCINO
DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

August 6, 2001

☐ LRG ☐ LRG
☐ RLT ☐ SBY
☐ FGR ☐ RSG

CSH
✓ LGRWK
Jm6
✓ CSH

Mr. Roger Sternberg
Mendocino Land Trust
P.O. Box 1094
Mendocino, CA 95460

Dear Mr. Sternberg:

Subject: Glass Beach Site Investigation And Proposed Mitigations

Per your request for comments I have completed review of the Glass Beach Site Investigation Report dated May, 2001. I offer the following comments on the proposed mitigations for your consideration:

1. Both clean closure and capping in place are approved procedures for remediation of burn dumps. The advantage to clean closure is once completed the property owner would be free to develop and use the site without any postclosure maintenance requirements.
2. Under the capping scenario it would be further recommended to restrict access onto the areas of identified waste through fencing and posting.
3. In a letter to you dated August 4, 1999, I identified capping in place as an adequate mitigation for Glass Beach.

If you have any questions please contact me at 463-4466.

Sincerely,

John P. Morley, REHS III

cc: Craig Hunt, NCRWQCB



CONSULTING ENGINEERS & GEOLOGISTS, INC.

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RWQCB
REGION 1

FEB 22 2001

<input type="checkbox"/> LAM	<input type="checkbox"/> CFI	<input type="checkbox"/> KAO
<input type="checkbox"/> RLF	<input type="checkbox"/> SCA	
<input type="checkbox"/> FCR	<input type="checkbox"/> RSG	

CSZ 2/23/01

Reference: 099215

February 16, 2001

Mr. Craig Hunt
California Regional Water Quality Control Board, North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403

**SUBJECT: ADDITIONAL HISTORICAL INFORMATION
GLASS BEACH PROPERTY, FORT BRAGG, CALIFORNIA
RWQCB CASE NO. INMC447**

Dear Mr. Hunt:

On February 14, 2001, SHN Consulting Engineers & Geologists, Inc. (SHN) received additional historical information in the form of aerial photographs for the Glass Beach property in Fort Bragg, California (site). Mr. Robert Armitage, a representative of Mr. David Blinn, provided this information.

Attached is an aerial photograph of the site taken in 1952, approximately 2 years after the City of Fort Bragg began using the southern portion of the property as a refuse disposal area. As shown on the attached photograph, an access road is present which leads to the refuse disposal area. Just to the north of the west end of the access road is a feature that may be a ravine or gully, a possible refuse dump area. This area is identified as Area II in the site investigation work plan prepared by SHN, dated August 2000. The detail map of Area II in the August work plan (Figure 3) shows that a majority of the investigation work in this area is to the west and north of the access road shown in the attached photograph. The proposed investigation area is supported by observed site conditions and the information obtained from the attached aerial photograph, and previously provided site historical information.

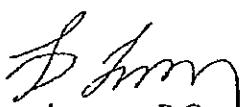
The attached photograph shows a small clearing along the bluff at the approximate midpoint of the site. SHN recommends that, as part of the upcoming field program, an inspection of this area along with the rest of the property be conducted to assess whether or not any other areas were used as refuse dump sites.

If based on observations made during the site inspection, it appears that other potential dump areas are identified, SHN will discuss investigation of these areas with the California Regional Water Quality Control Board, North Coast Region, including the drilling and sampling of soil borings. The intent is to investigate any identified areas during the upcoming field program, and include the results in the site investigation report that will be prepared for the site.

Please do not hesitate to contact me at 441-8855 with any questions you may have.

Sincerely,

SHN CONSULTING ENGINEERS & GEOLOGISTS, INC.

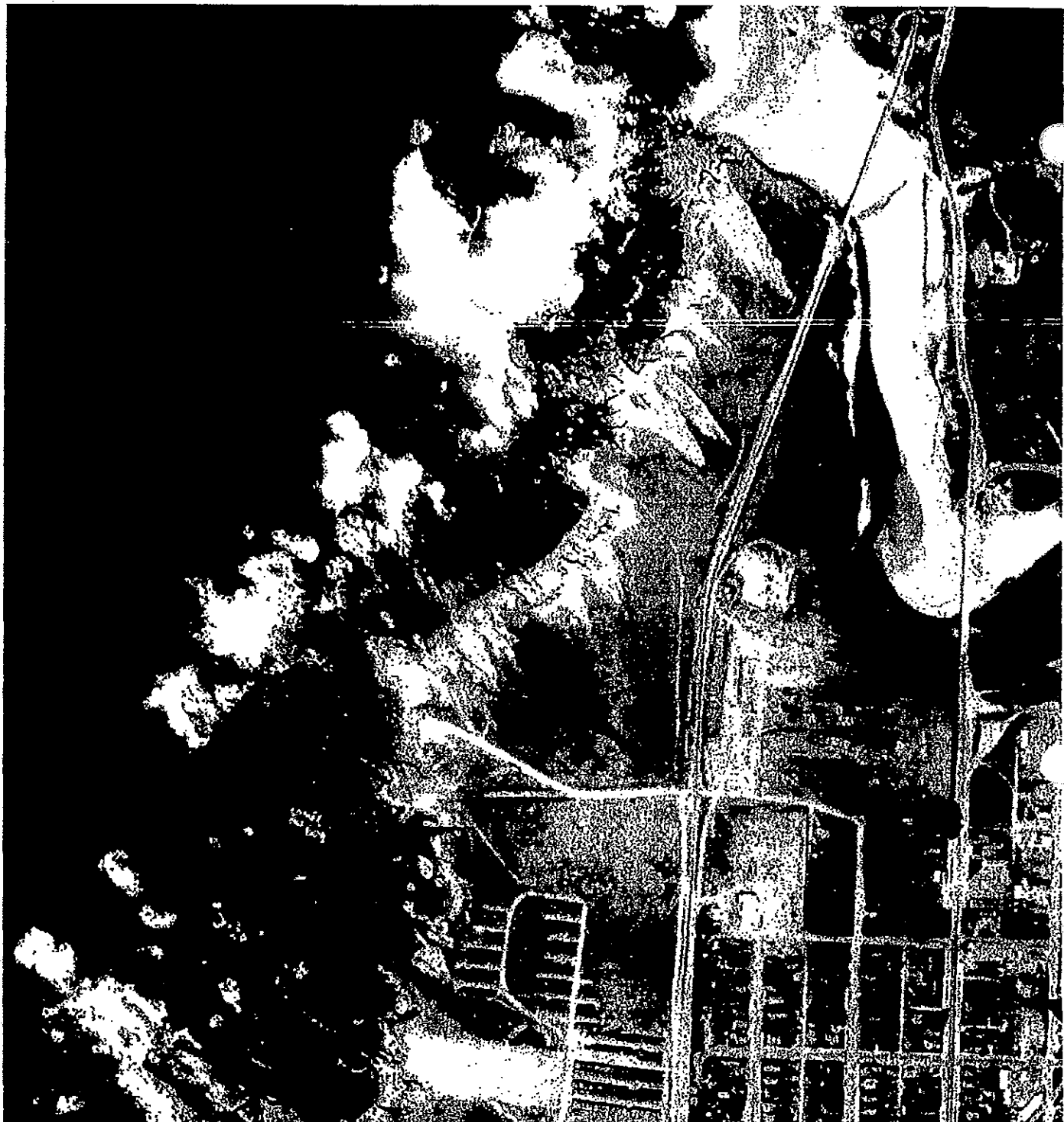

Frans Lowman, R.G.
Senior Project Manager

FL:lms
Attachment (Photo)

GA1999\099215\ltr\Glass-Beach.RWQCB-addl info-ltr.doc

ATTACHMENT I

SITE PHOTO



GLASS BEACH/BLINN PROPERTY
FORT BRAGG, CALIFORNIA

GLASS BEACH PROPERTY
PHOTO 3, TAKEN 1952

SHN 099215
JANUARY, 1952



California Regional Water Quality Control Board

North Coast Region



Vinston H. Hickox
Secretary for
Environmental
Protection

William A. Hoy, Chairman

Gray Davis
Governor

Internet Address: <http://www.swrcb.ca.gov/~rwqcb1/>
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone 1-877-721-9203 (toll free) • Office (707) 576-2220 • FAX (707) 523-0135

January 8, 2001

Mr. David Blinn
1543 Lewiston Drive
Sunnyvale, CA 94087

Dear Mr. Blinn:

Subject: Glass Beach Property, West Elm Street, Fort Bragg
Case No. 1NMC447

North Coast Regional Water Quality Control Board (Regional Water Board) staff have reviewed the work plan submitted to this office by SHN for investigation at the subject site. The work plan was incomplete. It did not include the additional historical review requested in our July 7, 2000 letter. We may not be able to make a decision on remedial actions based on the proposed work. In addition, the following comments need to be satisfactorily addressed:

- The rationale for the locations and spacing of the proposed borings and groundwater samples should be stated.
- The work outlined in the work plan may not accomplish the stated goal of assessing the extent of contamination in the dump areas. The work may fail to determine the horizontal extent of waste since no contingencies were included for additional borings or investigation if the edge of the waste is not found with the planned borings. If the proposed work is to accomplish that stated goal, the work plan should address this eventuality.
- The depth of the borings was not specified in the work plan. The total depth of refuse will need to be determined in the areas being investigated.
- It was stated in the work plan that a soil sample near the groundwater table will be collected from each boring and that additional samples may be analyzed. The method for selecting other soil samples for analysis was not specified. The criteria for selecting samples for analyses should be specified.
- The method with which the locations of the borings will be surveyed was not stated in the work plan.
- In Area II, boring SB-3 from the previous investigation had higher than background concentrations of lead, zinc, and TPH-mo. However, no additional investigation as far east as SB-3 was proposed for Area II. This omission should either be corrected or justified.

California Environmental Protection Agency



January 8, 2001

- There was surficial evidence of past refuse dumping to the north of Area II. No investigation has been proposed for this area. This area should be evaluated for possible subsurface investigation.
- The site has been identified as a former burn dump. The California Integrated Waste Management Board issued guidance pertaining to burn dump sites: LEA advisory #56 (November 4, 1998), "Process for Evaluating and Remediating Burn Dump Sites." Based on that advisory, all soil samples should be analyzed for the following:
 - CAM 17 metals (Sb, As, Ba, Be, Ce, Cr, Co, Cu, Pb, Hg, Mo, Ni, Se, Ag, Tl, V, Zn) Totals test, EPA method 6010/7471
 - pH, EPA method 9040

The three samples containing the highest lead concentrations from each of the two areas should be analyzed for the following:

- CAM 5 metals (Cd, Cr, Ni, Pb, Zn) WET procedure, EPA method 6010
- Lead and zinc by a modified WET procedure, using deionized water as the leaching agent, EPA method 6010
- TCLP RCRA metals (Ag, As, Ba, Cd, Cr, Hg, Pb, Se), EPA method 1311

Also, if the concentration, in mg/kg, from the totals test of any metal that is not listed in the CAM 5 list is higher than 10 times the STLC regulatory level, in mg/L, then that metal should be analyzed for using the WET procedure. The sample with the highest concentration of that metal should be the sample analyzed.

The petroleum hydrocarbon target analytes for soil and groundwater samples and the other target analytes for groundwater samples specified in the work plan are acceptable.

- The work plan did not include a health and safety plan. The health and safety plan should be submitted to this office before the investigation is performed.

Please submit a response addressing these comments. We will expedite our review of the response to the extent possible. If you have any questions or would like to arrange a meeting to discuss the work, please call me at (707) 570-3767.

Sincerely,



Craig Hunt
Water Resource Control Engineer

CSH:delGlass Beach 0012.doc

California Environmental Protection Agency

January 8, 2001

cc: Robert D. Armitage, Penitenti/Petersen Realty, Inc., 720 S. Main Street, Box 579,
Fort Bragg, CA 95437
Roger Sternberg, Mendocino Land Trust, P.O. Box 1094, Mendocino, CA 95460
Frans Lowman, SHN Consulting Engineers & Geologists, Inc., 812 W. Wabash,
Eureka, CA 95501-2138
Moir McEnespy, California State Coastal Conservancy, 1330 Broadway, 11th Floor,
Oakland, CA 94612-2530
Dave Goble, Public Works Department, 416 N. Franklin Street, Fort Bragg, CA 95437
Dave Koppel, Mendocino County Environmental Health Department, 501 Low Gap Road,
Room 1326, Ukiah, CA 95482
John P. Morley, Mendocino County Environmental Health Department, 501 Low Gap Road,
Room 1326, Ukiah, CA 95482
Ron Munson, California Department of Parks and Recreation, P.O. Box 440,
Mendocino, CA 95460
Mike August, California Department of Parks and Recreation, P.O. Box 942896,
Sacramento, 94296-0001
Linda Ruffing, Community Development Department, City of Fort Bragg, 416 N. Franklin Street,
Fort Bragg, CA 95437

California Environmental Protection Agency

Enforcement Agency:

Page of

FACILITY FILE NUMBER 23-CR-0010	PROGRAM CODE LOCAL = L STATE = S L	INSPECTION DATE MM DO YY 11-28-00	TIME IN TIME OUT	INSPECTION TIME 2
FACILITY NAME Fort Bragg Glass Beach			RECEIVED BY (OPERATOR)	
FACILITY LOCATION Elm Street			OWNER	
INSPECTOR J. Morley	INSPECTOR SIGNATURE <i>J. Morley</i>		ALSO PRESENT	
THE ABOVE FACILITY WAS INSPECTED FOR COMPLIANCE WITH APPLICABLE SECTIONS OF DIVISION 30 OF THE PUBLIC RESOURCES CODE (PRC) and TITLE 27 CALIFORNIA CODE OF REGULATIONS (CCR)				

THE STANDARDS BELOW ARE CONSIDERED IN COMPLIANCE UNLESS OTHERWISE MARKED WITH ONE OF THE FOLLOWING V = VIOLATION A = AREA OF CONCERN NA = NOT APPLICABLE

SITES NOT SUBJECT TO ARTICLE 2 STANDARDS		V	A	NA
20530 - SITE SECURITY				
20550 - GRADING OF FILL SURFACES				
20750 - SITE MAINTENANCE				
20790 - LEACHATE CONTROL				
20820 - DRAINAGE / EROSION CONTROL				
20830 - LITTER CONTROL				
20919 - GAS CONTROL				
21190(c) - POSTCLOSURE LAND USE				
OTHER				

RWQCB
REGION 1
DEC 01 2000
☐ ECR ☐ CWS ☐ CFWB
☐ NPD ☐ RSG
 TSWS
 E Hunt

COMMENTS (USE SMS 43 FOR ADDITIONAL SPACE)

Inert waste throughout area
 Area of Concern: (20820) Erosion Control:
 Erosion cutting into old burn dump exposing
 metals: glass. Approximately 50 foot section of exposed
 waste.
 Regional Water Quality Control Board is lead agency
 for site mitigation

CC: Craig Hunt, NCRWQCB

SPACE FOR ADDITIONAL COMMENTS, DIAGRAMS, OR NOTES.

TRANSMITTAL SHEET



Consulting Engineers & Geologists

812 W. Wabash
Eureka, CA 95501
Phone - (707) 441-8855
FAX - (707) 441-8877

November 13, 2000

From: Frans Lowman


To: Craig Hunt, Water Resources Control Engineer
California Regional Water Quality Control Board, North Coast Region
5550 Skylane Blvd., Suite A
Santa Rosa, California 95403

Dear Mr. Hunt,

Enclosed please a copy of the work plan to conduct additional site investigation work at the Glass Beach property in Fort Bragg, California. This work plan is being submitted on behalf of Mr. David Blinn. Please do not hesitate to contact me at (707) 441-8855 with any questions you may have.

Sincerely,

SHN Consulting Engineers & Geologists, Inc.


Frans Lowman, RG
Senior Project Hydrologist
enclosure

cc: Mr. Robert Armitage, Penitenti/Petersen Realty, Inc.
720 S. Main Street, Ft. Bragg, CA 95437
Mr. Roger Sternberg, Executive Director, Mendocino Land Trust, Inc.
John Morley, Mendocino County Health Department
Ron Munson, California Department of Parks and Recreation.

RWQCB
REGION 1
NOV 16 2000
☐ LAM
☐ RLT
☐ LMF
☐ CRJ
☐ SAW
☐ FOR
☐ KAD
254 11/20/00



RWQCB
REGION 1

OCT 19 2000

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<input type="checkbox"/> RLT	<input checked="" type="checkbox"/> SAW	<input type="checkbox"/> KAD
<input type="checkbox"/> LMF	<input type="checkbox"/> JH	<input type="checkbox"/> CH

CH 10/23/00

October 18, 2000

Robert La Belle
District Superintendent
Russian River/Mendocino District
State Dept. of Parks & Recreation
P.O. Box 440
Mendocino, CA 95460

Susan Warner
Division Chief
Cleanup and Special Investigations
RWQCB - North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403

Subject: State acquisition of the Glass Beach property, Fort Bragg, Mendocino County; time and money constraints

Dear Mr. La Belle and Ms. Warner:

The Coastal Conservancy staff is excited about the possibility of funding the acquisition of Glass Beach for public access, recreation and open space preservation purposes. Glass Beach exemplifies the beautiful coastal landscape of Mendocino County and will be an important addition to MacKerricher and the State's park system.

The Conservancy was very pleased to learn that the Glass Beach acquisition project was earmarked to receive a federal grant of \$ 2,500,000 from the Conservation Lands Share of the Transportation Enhancement Activities ("TEA") program. However, these grant funds will not be obligated and released until the site is remediated to the satisfaction of the Regional Water Quality Control Board, North Coast Region ("RWQCB"). Furthermore, as the grant was awarded in the previous federal fiscal year, the Conservancy has been told by Caltrans Headquarters that the acquisition should have been completed this past June. Although the grant funds have remained available to the Conservancy to date, Caltrans has informed us in writing that if the Conservancy does not show a good faith effort to expedite the project and continuous progress toward project completion, the funds will be lost.

Hence, we are asking that both State Parks and RWQCB staff help expedite the processes of site assessment and characterization, site remediation and closure, and taking of title to the greatest extent possible. Specifically, your immediate attention to the following present and upcoming tasks and activities is needed:

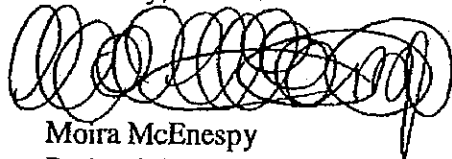
1330 Broadway, 11th Floor
Oakland, California 94612-2530
510-286-1015 Fax: 510-286-0470

Re: Glass Beach Acquisition

- State Parks review of the draft workplan to further assess and characterize the site in response to the RWQCB's July 7, 2000, request;
- RWQCB review and approval of the workplan, which must be carried out before an appraisal can be completed and before any sale negotiations can commence;
- Determination of the appropriate level of remediation, in coordination with the County Health Department;
- RWQCB post-remediation site inspections and drafting of the memo recommending site closure;
- State Parks' ability to immediately take title to the property at the time grant funds are ready to be disbursed, in order to avoid having to find an interim owner.

We would appreciate a written communication from each of you estimating when each of these tasks will be completed, or, where not possible, at least setting forth ranges of time and listing contingencies and obstacles. The project proponents would all hate to lose this project, not least the Conservancy, which has already committed considerable time and funding. Thank you in advance for your cooperation and attention to these tasks. We look forward to hearing from you and working together to take advantage of this grant and acquisition opportunity.

Cordially,



Moira McEnespy
Project Manager

cc: Greg Picard
Sector Superintendent
State Parks
Russian R./Mendocino District
Mendocino Sector
P.O. Box 440
Mendocino, CA 95460

Ron Munson
Supervising Ranger
State Parks
Russian R./Mendocino District
Mendocino Sector
P.O. Box 440
Mendocino, CA 95460

John Morley
Mendocino County Public
Health Dept.
Environmental Health
120 W. Fir
Fort Bragg, CA 95437

Roger Sternberg
Executive Director
Mendocino Land Trust
P.O. Box 1094
Mendocino, CA 95460

Connie Jackson
City Manager
City of Fort Bragg
416 N. Franklin Street
Fort Bragg, CA 95437

David Blinn
William J. Blinn Trust
1543 Lewiston Drive
Sunnyvale, CA 94987

UKIAH OFFICE

501 LOW GAP ROAD, ROOM 1326
UKIAH, CA 95482
(707) 463-4166
FAX (707) 463-4038

HAZARDOUS MATERIALS
(707) 463-5425



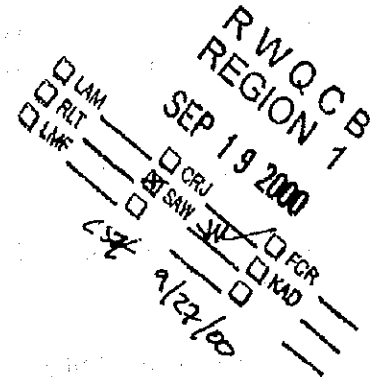
FORT BRAGG OFFICE

790-A1 S FRANKLIN STREET
FORT BRAGG, CA 95437
(707) 961-2714
FAX (707) 961-2720

COUNTY OF MENDOCINO
DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

September 13, 2000

Mr. Roger Sternberg
Mendocino Land Trust, Inc
P.O. Box 1094
Mendocino, CA 95460



Dear Mr. Sternberg:

Subject: Glass Beach Ocean Dump Site

I have been in communication with the California Integrated Waste Management Board (CIWMB). The CIWMB is the state oversight agency for solid waste management. The CIWMB has a Solid Waste Disposal Site Cleanup Program that allocates funding to assist local communities clean up illegal dump sites and old burn dump sites.

Staff at the CIWMB have expressed interest in Glass Beach as a site eligible for funding to assist in costs for waste characterization and clean closure. A typical funding option is a matching grant that covers 50% of eligible costs.

Please let me know if your agency is interested in pursuing a grant application with the CIWMB. I can be reached at 463-4466.

Sincerely,

A handwritten signature in dark ink, appearing to read "J.P. Morley".

John P. Morley, REHS III

cc: Scott Walker, CIWMB
William Blinn, property owner
Dave Goble, City of Fort Bragg
Craig Hunt, NCRWQCB

UKIAH OFFICE

501 LOW GAP ROAD, ROOM 1526
UKIAH, CA 95482
(707) 463-1100
FAX (707) 463-1038

HAZARDOUS MATERIALS
(707) 463-5425



FORT BRAGG OFFICE

790-A1 S FRANKLIN STREET
FORT BRAGG, CA 95437
(707) 961-2714
FAX (707) 961-2720

**COUNTY OF MENDOCINO
DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH**

June 21, 2000

**R W Q C B
REGION 1**

JUN 23 2000

<input type="checkbox"/> LAM	<input type="checkbox"/> CRJ	<input type="checkbox"/> FCR
<input type="checkbox"/> RLT	<input checked="" type="checkbox"/> SAW	<input type="checkbox"/> RAD
<input type="checkbox"/> LMF	<input type="checkbox"/>	<input type="checkbox"/>

Craig Hunt
Water Resource Control Engineer
Regional Water Quality Control Board
5550 Skylane Blvd. Suite A
Santa Rosa, CA 95403

GSH

Dear Mr. Hunt:

Re: Remediation Of The Glass Beach Ocean Dump Site

The Mendocino Land Trust has been in communication with the Division of Environmental Health (EH) concerning the possible purchase of the Glass Beach Ocean Dump Site property and associated remedial action(s). In a letter to the Mendocino Land Trust dated August 4, 1999, EH identified some mitigations that would be required at the site which included:

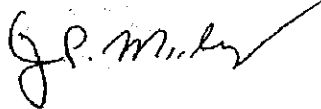
1. Construction of a retaining wall to prevent erosion.
2. Additional soil cover to be applied in the area of the landfill.
3. Construction of a safety railing.

These mitigations are consistent with the California Code of Regulations Title 27 Section 21190, open space post closure land use, and the California Integrated Waste Management Board LEA Advisory #56, Process For Evaluating And Remediating Burn Dump Sites.

This letter is to recognize on June 13, 2000, at a meeting attended by several parties involved in the Glass Beach project, the Regional Water Quality Control Board (RWQCB) assumed the role of lead agency and will be responsible for overseeing remedial action(s) at the Glass Beach Ocean Dump Site.

If you have any questions please contact me at 463-4466.

Sincerely,



John P. Morley
Environmental Health Specialist III

cc: Roger Sternberg, Mendocino Land Trust
William Blinn, Property Owner
Dave Goble, City of Fort Bragg
Scott Humpert, CIWMB



California Regional Water Quality Control Board

North Coast Region

Winston H. Hickox
Secretary for
Environmental
Protection

William A. Hoy, Chairman



Gray Davis
Governor

Internet Address: <http://www.swrcb.ca.gov/~rwqcb1/>
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone 1-887-721-9203 Office (707) 576-2220 Fax (707) 523-0135

July 7, 2000

Mr. David Blinn
1543 Lewiston Drive
Sunnyvale, CA 94087

Dear Mr. Blinn:

Subject: Glass Beach Property, West Elm Street, Fort Bragg, California
Case No. INMC447

We appreciated meeting with your representative and the other involved agencies to discuss requirements for investigating and cleaning up residual wastes at the Glass Beach site.

Pursuant to the California Code of Regulations, Title 27, §20090(d), we require additional information on potential source areas and additional sampling to properly characterize the remaining wastes. To that end, we are requesting that a workplan to characterize the site be submitted.

The workplan should contain all available historical information on site use. This includes a comprehensive to-scale base map showing historical use areas in detail, incorporating information from aerial photographs (which may be available at the Fort Bragg Historical Society, City of Fort Bragg Public Works, Georgia Pacific Mill, etc.). Information derived from these and other sources may be used to complement and compare with the data and information developed to date.

The proposed sampling should be keyed to the types of wastes found through the historical review. The analyses to be performed should include STLC and TTLC tests to characterize the wastes remaining at the site. Also, modified STLC tests (water extract) will be needed to determine the threat to groundwater. Storm water sampling and seep sampling should also be considered.

Section 13304 of the California Water Code allows the Regional Water Board to recover reasonable expenses from a responsible party for overseeing site investigation and cleanup of unregulated discharges adversely affecting or threatening to affect the State's waters. The Regional Water Board intends to recover costs for regulatory oversight work conducted at this site.

California Environmental Protection Agency

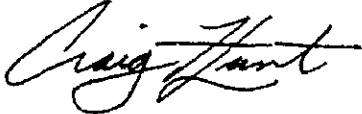


Recycled Paper

July 7, 2000

We will expedite our review of the workplan to the extent possible. If you have any questions, please call me at (707) 570-3767.

Sincerely,



Craig Hunt
Water Resource Control Engineer

CSH:trnk\glassbeach0007.doc

cc: Robert D. Armitage, Penitenti/Petersen Realty, Inc., 720 S. Main Street, Box 579,
Fort Bragg, CA 95437
Dave Goble, Public Works Department, 416 N. Franklin Street,
Fort Bragg, CA 95437
Dave Koppel, Mendocino County Health Department, 501 Low Gap Road,
Room 1326, Ukiah, CA 95482
Frans Lowman, SHN Consulting Engineers & Geologists, Inc., 812 W. Wabash,
Eureka, CA 95501-2138
Moira McEnespy, California State Coastal Conservancy, 1330 Broadway,
11th Floor, Oakland, CA 94612-2530
John P. Morley, Mendocino County Health Department, 501 Low Gap Road,
Room 1326, Ukiah, CA 95482
Ron Munson, California Department of Parks and Recreation, P.O. Box 440,
Mendocino, CA 95460
Roger Sternberg, Mendocino Land Trust, P.O. Box 1094, Mendocino, CA 95460

California Environmental Protection Agency



Recycled Paper

APPENDIX D

FILE REVIEW DOCUMENTS

***GROUNDWATER MONITORING REPORT; SECOND QUARTER 2002, WALSH
OIL ONE STOP***



LACO ASSOCIATES

CONSULTING ENGINEERS

LEONARD M. OSBORNE • CE 38573
DAVID R. GERVAN • CE 57282
DAVID N. LINDBERG • RG 5581/CEG 1895
FRANK R. BICKNER • REA 2138
RONALD C. CHANEY • CE 29027/GE 000934
HOWARD W. GARDNER • ME 21300/CHE 4063
CHARLES W. GALLATY • CE 20181

July 12, 2002

4598.01

California Regional Water Quality Control Board
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

Attention: Dan Warner

Subject: Groundwater Monitoring Report; Second Quarter, 2002
Walsh Oil One Stop, 105 South Main Street, Fort Bragg, California
Case No. 1TMC388

COPY

Dear Mr. Warner:

This report presents the results of groundwater monitoring for the second quarter of 2002 at the Walsh Oil One Stop Shop, located at 105 South Main Street, Fort Bragg, California (Figure 1). On April 16, 2002, LACO ASSOCIATES (LACO) measured the depth-to-groundwater and collected groundwater samples from monitoring wells MW-1, MW-2, and MW-3. Following depth-to-water measurements, the wells were purged and allowed to recharge. Groundwater samples were then collected using disposable bailers, transferred into laboratory-supplied containers, kept cold, and transported to North Coast Laboratories (NCL) under chain-of-custody protocol for analysis of:

- Total Petroleum Hydrocarbons as gasoline (TPHg) by EPA Method 8015B
- Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX) by EPA Method 8260B
- Methyl Tertiary Butyl Ether (MTBE), Tertiary Amyl Methyl Ether (TAME), Ethyl Tertiary Butyl Ether (ETBE), Di-isopropyl Ether (DIPE), and Tertiary Butyl Alcohol (TBA) by EPA Method 8260B
- Lead Scavengers by EPA Method 8260B

Groundwater Gradient

Groundwater gradients were calculated from groundwater elevations recorded for monitoring wells MW-1 through MW-3 using the three-point method. Groundwater elevations are summarized in Table 1. On April 16, 2002, the groundwater flow direction was S21°W with a slope of 0.29 percent (Figure 2). This quarter has the most shallow groundwater slope observed to date. Historical groundwater gradients are included as Table 2.

As stated in previous reports, gradient calculations over several monitoring periods show that groundwater flow is toward the southeast in the vicinity of this site. This gradient is counterintuitive to known topography, indicating groundwater flow to the northwest. As mentioned in a previous report, the site straddles a marine bedrock terrace that is apparently offset by a minimum of 10 feet. The elevation of the lower surface of the terrace has not yet

been determined. The irrigation wells at the adjacent Georgia-Pacific Mill site are installed in this lower unit. If there is recharge from this unit near the riser forming the offset, it may influence the apparent flow direction. This topic will be addressed in more detail in an upcoming problem assessment report.

Laboratory Results and Discussion

Laboratory results are summarized in Table 1 and copies of the laboratory reports are included as Attachment 1. The laboratory indicated that TPHg was detected in groundwater from both the upgradient monitoring well MW-1 (110 µg/l) and the downgradient monitoring well MW-3 (220 µg/l) for the sampling event on April 16, 2002 (Figure 3). The laboratory noted, however, that the material reported as TPHg in monitoring wells MW-1 and MW-3 did not present a peak pattern consistent with that of gasoline. NCL verbally confirmed material reported as TPHg in MW-1 and MW-3 to be tetrachloroethene (perc). No other analytes were detected at the standard limits of detection.

Until the concentration of TPHg is quantified independent from the perc, it is difficult to assess the degree of groundwater contamination at the site. Results from the installation of the monitoring wells and borings in April 2000 suggest that soil contamination by TPHg is concentrated in three hot spots; two near the pump islands (to the west and to the north) and one near the UST cavity.

The installation of additional borings and monitoring wells proposed in an approved workplan will further delineate the extent of soil and groundwater contamination. The workplan will be implemented after securing bids and pre-approval from the Underground Storage Tank Cleanup Fund (USTCF).

Thank you for this opportunity to be of service. If you need further assistance or if you have any questions, please call.

Sincerely,
LACO ASSOCIATES

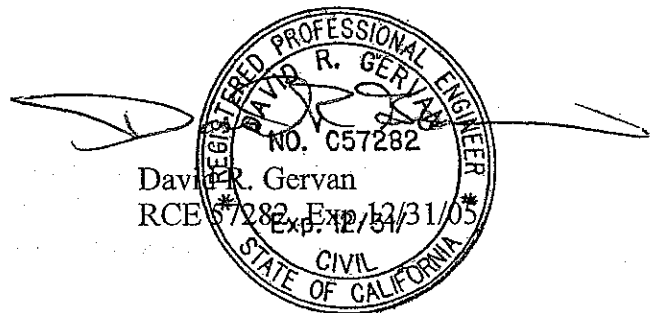


Christine S. Manhart
Staff Geologist

GJE: cs

Attachments

cc: Clarence Walsh, Walsh Oil Company
George Hynek, Mendocino County Public Health
Doug Heitmeyer, Georgia Pacific Corporation



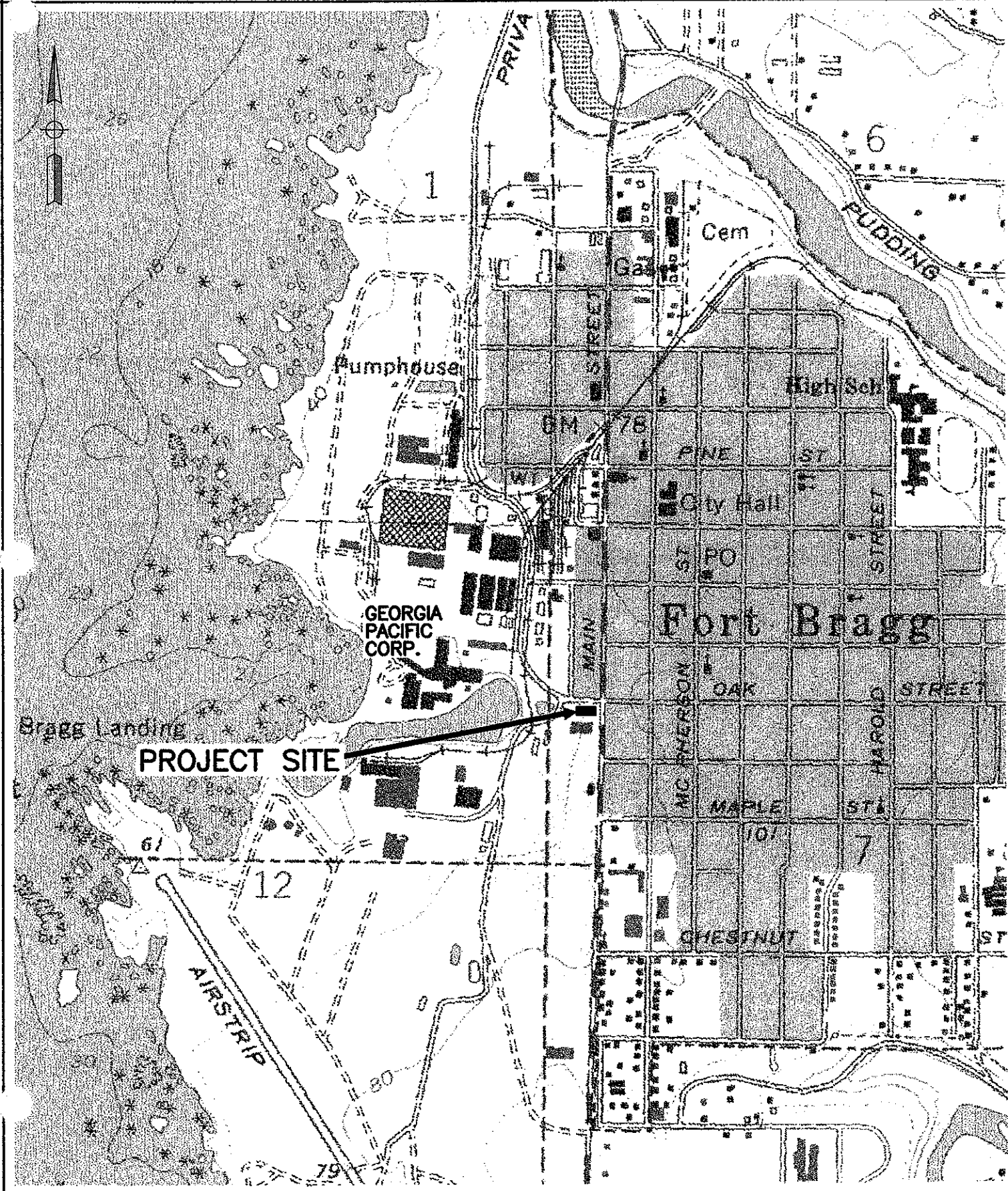


LACO ASSOCIATES

CONSULTING ENGINEERS

21 W 4TH ST. EUREKA, CA 95501 (707)443-5034

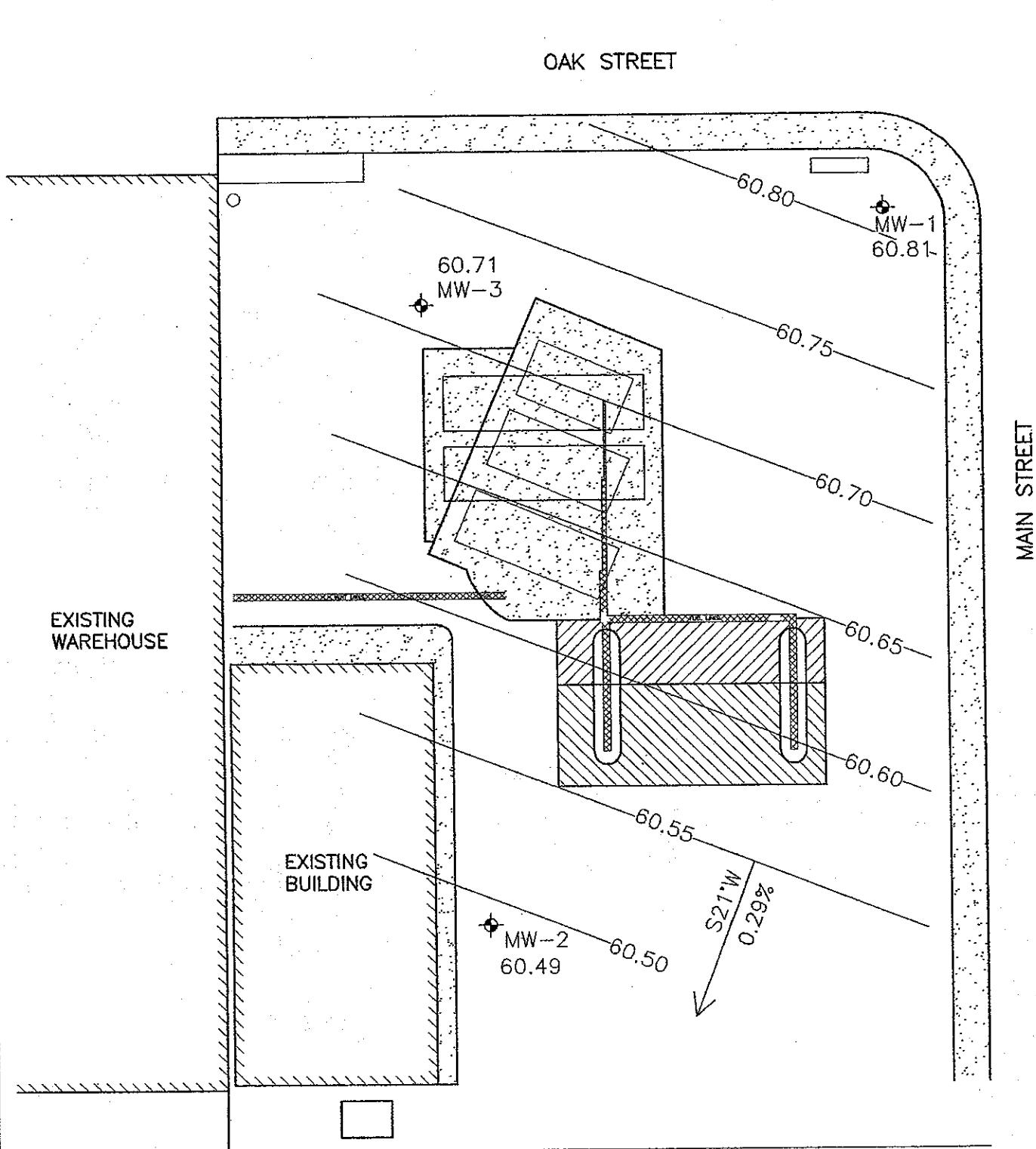
PROJECT	GROUNDWATER MONITORING REPORT	BY	rjm	FIGURE	1
CLIENT	WALSH OIL COMPANY	DATE	6/24/02		
LOCATION	ONE STOP SHELL, 105 S.MAIN, FORT BRAGG	CHECKED		JOB NO.	4598.01
	LOCATION MAP	SCALE	1"=1000'		





LACO ASSOCIATES
CONSULTING ENGINEERS
21 W 4TH ST. EUREKA, CA 95501 (707)443-5054

PROJECT	GROUNDWATER MONITORING REPORT	BY	BAB	FIGURE	2
CLIENT	WALSH OIL COMPANY	DATE	6/10/02	JOB NO.	4598.01
LOCATION	ONE STOP SHELL, 105 S.MAIN, FT. BRAGG	CHECK			
	GROUNDWATER GRADIENT (4-16-02)	SCALE	1"=20'		



LEGEND

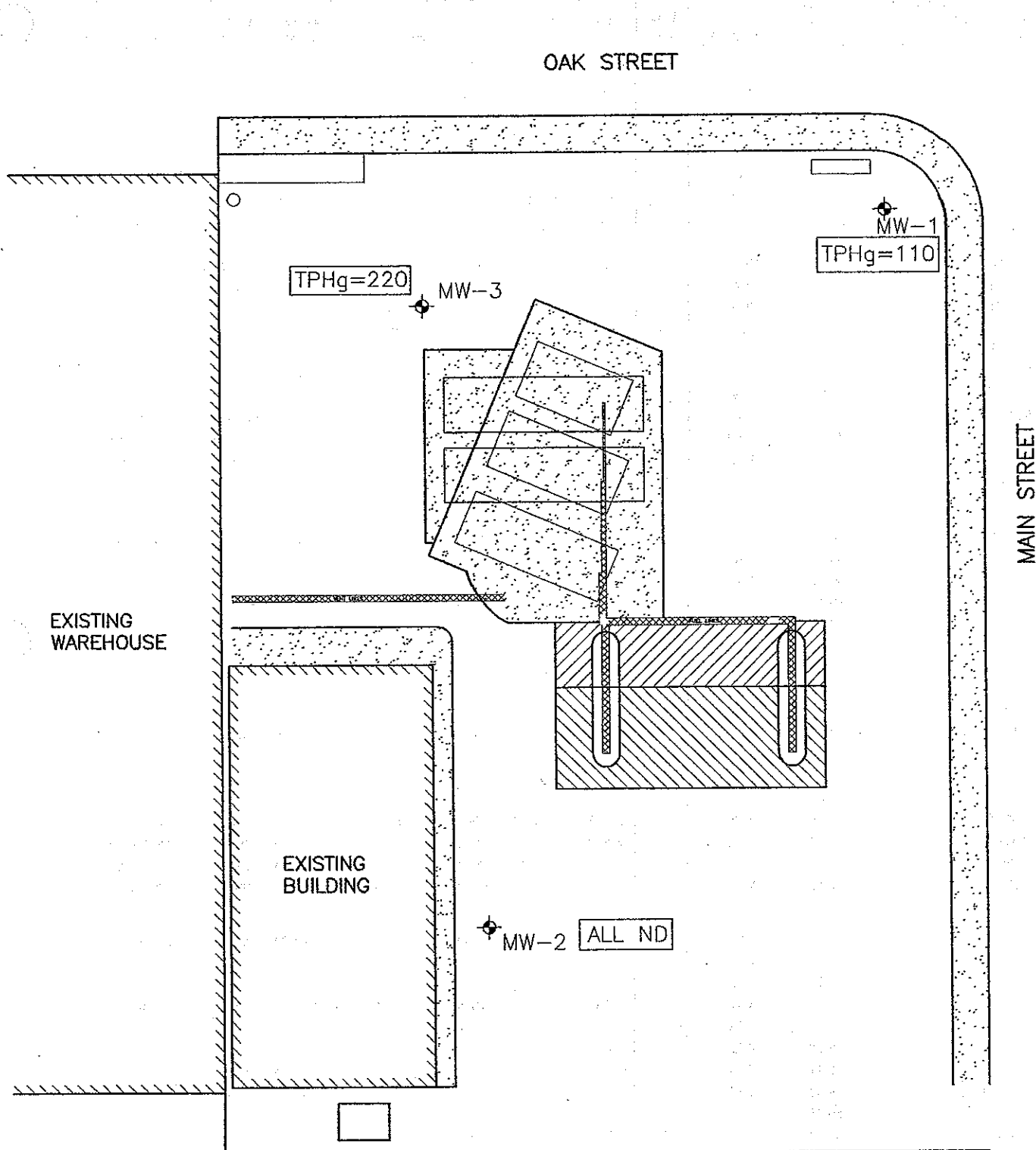
MONITORING WELLS w/GROUNDWATER SURFACE ELEVATIONS

61.50 — MONITORING WELL GROUNDWATER SURFACE CONTOUR



LACO ASSOCIATES
CONSULTING ENGINEERS
21 W 4TH ST. EUREKA, CA 95501 (707)443-5054

PROJECT	GROUNDWATER MONITORING REPORT	BY	BAB	FIGURE	3
CLIENT	WALSH OIL COMPANY	DATE	6/10/02	JOB NO.	4598.01
LOCATION	ONE STOP SHELL, 105 S.MAIN, FT. BRAGG	CHECK			
	CONTAMINANT DISTRIBUTION (4-16-02)	SCALE	1"=20'		



LEGEND

MONITORING WELLS w/GROUNDWATER SURFACE ELEVATIONS

ALL RESULTS SHOWN IN MICROGRAMS PER LITER ($\mu\text{g/L}$)

ND = NON DETECT

TABLE 1: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS

Walsh One Stop Shop, 105 South Main St, Fort Bragg, CA
LACO No. 4598.01; CRWQCB Case No. 1TMC388

WELL Sample Date	Groundwater Measurements			Foot- notes	Analytical Results						
	Well Head Elevation (feet msl)	Groundwater Elevation (feet msl)	Depth to Water (feet)		TPH (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Xylenes (µg/l)	MTBE (µg/l)	Other Analytes (µg/l)
			mch(mf)		---	1.0	150	700	1,750	(35)	
			tot		5	170	42	29	17	---	
MW-1	69.37										
4/12/00		61.23	8.14		120	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50-10
5/17/00		60.72	8.65		---	---	---	---	---	---	---
6/27/00		60.05	9.32		---	---	---	---	---	---	---
8/2/00		59.53	9.84		120	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<0.50-10
8/28/00		59.24	10.13		---	---	---	---	---	---	---
9/25/00		59.06	10.31		---	---	---	---	---	---	---
10/27/00		59.04	10.33		230	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50-10
11/14/00		59.16	10.21		---	---	---	---	---	---	---
12/27/00		59.31	10.06		---	---	---	---	---	---	---
2/1/01		59.82	9.55	3	190	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<0.50-10
2/21/01		61.10	8.27		---	---	---	---	---	---	---
3/9/01		61.78	7.59		---	---	---	---	---	---	---
4/23/01		60.78	8.59		---	---	---	---	---	---	---
7/24/01		59.50	9.87		120	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-10
10/10/01		58.80	10.57	3	170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-5.0
1/28/02		62.46	6.91	1,3,5	78	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<1.0-20
4/16/02		60.81	8.56	1,3	110	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<1.0-20
MW-2	68.61										
4/12/00		60.85	7.76		230	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50-10
5/17/00		60.41	8.20		---	---	---	---	---	---	---
6/27/00		60.97	7.64		---	---	---	---	---	---	---
8/2/00		59.15	9.46		150	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<0.50-10
8/28/00		58.80	9.81		---	---	---	---	---	---	---
9/25/00		58.55	10.06		---	---	---	---	---	---	---
10/27/00		58.52	10.09		300	ND<1.3	ND<1.3	ND<1.3	ND<1.3	ND<1.3	ND<0.50-10
11/14/00		58.69	9.92		---	---	---	---	---	---	---
12/27/00		58.88	9.73		---	---	---	---	---	---	---
2/1/01		59.40	9.21		ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<0.50-10
2/21/01		60.37	8.24		---	---	---	---	---	---	---
3/9/01		61.41	7.20		---	---	---	---	---	---	---
4/23/01		60.48	8.13		---	---	---	---	---	---	---
7/24/01		59.14	9.47		ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-10
10/10/01		58.30	10.31		ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-5.0
1/28/02		61.40	7.21	5	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-20
4/16/02		60.49	8.12	4	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<1.0-20
MW-3	67.70										
4/12/00		61.09	6.61		280	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50-10
5/17/00		60.67	7.03		---	---	---	---	---	---	---
6/27/00		58.79	8.91		---	---	---	---	---	---	---
8/2/00		59.63	8.07		58	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50-10
8/28/00		59.38	8.32		---	---	---	---	---	---	---
9/25/00		59.18	8.52		---	---	---	---	---	---	---
10/27/00		59.11	8.59		ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50-10
11/14/00		59.33	8.37		---	---	---	---	---	---	---
12/27/00		59.51	8.19		---	---	---	---	---	---	---
2/1/01		60.04	7.66	3,4	340	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-20
2/21/01		60.80	6.90		---	---	---	---	---	---	---
3/9/01		61.75	5.95		---	---	---	---	---	---	---
4/23/01		60.70	7.00		---	---	---	---	---	---	---
7/24/01		59.60	8.10		140	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-10
10/10/01		58.93	8.77	3	220	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-5.0
1/28/02		61.82	5.88	1,3,5	170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-20
4/16/02		60.71	6.99	1,3	220	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<1.0-20

TABLE 2: GROUNDWATER GRADIENT

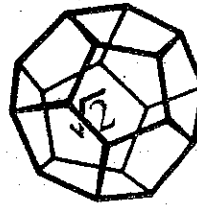
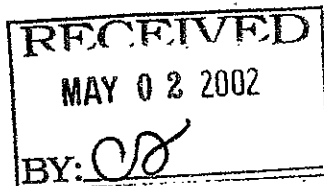
Walsh One Stop Shop, 105 South Main St, Fort Bragg, CA

LACO No. 4598.01; CRWQCB Case No. ITMC388

Date	Direction	Slope
4/12/00	S28W	0.34%
5/17/00	S4E	0.30%
6/27/00	N45W	4.40%
8/2/00	N45W	2.70%
8/28/00	S29E	0.72%
9/25/00	S25E	0.75%
10/27/00*	S38E	0.33%
11/14/00*	S40E	3.40%
12/27/00*	S41E	4.60%
2/1/01*	S39E	3.40%
2/21/01*	S31E	2.90%
3/9/01*	S39E	3.00%
7/24/01*	S40E	3.20%
10/10/01*	S39E	3.40%
1/28/02	S56W	1.1%
4/16/02	S21W	0.29%

*Gradient calculated with incorrect groundwater elevations for MW-2 and MW-3.

Attachment 1



**NORTH COAST
LABORATORIES LTD.**

April 30, 2002

One Stop Shop
635 N. Franklin
Fort Bragg, CA 95437

Attn: Clarence Walsh

RE: 4598.01, Walsh Oil/One Stop Shop

Order No.: 0204457

Invoice No.: 24300

PO No.:

ELAP No. 1247-Expires July 2003

LMO ☒
DRG ☒
DNL ☐
VFRB ☐
GLM ☐
HPI ☐
GEO ☐
CSM ☒
FILE ☒ Lab res.

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
01A	4598-MW1-W
01D	4598-MW1-W
02A	4598-MW2-W
02D	4598-MW2-W
03A	4598-MW3-W
03D	4598-MW3-W
04A	4598-QCTB-W
05A	4598-QCFD-W
06A	4598-QCMB-W

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

REPORT CERTIFIED BY

Laboratory Supervisor(s)

QA Unit

Jesse G. Chaney, Jr.
Laboratory Director

North Coast Laboratories, Ltd.

Date: 30-Apr-02

CLIENT: One Stop Shop
Project: 4598.01, Walsh Oil/One Stop Shop
Lab Order: 0204457

CASE NARRATIVE

All samples requesting silica gel cleanup were initially analyzed for diesel/motor oil. The samples showing no detectable levels of the analytes were not subjected to the cleanup procedure.

Gasoline Components/Additives:

4598-MW1-W, 4598-MW3-W and 4598-QCFD-W do not present a peak pattern consistent with that of gasoline. The reported results represent the amount of material in the gasoline range.

Some reporting limits were raised for 4598-MW2-W due to matrix interference.

The laboratory control sample duplicate (LCSD) recovery was below the lower acceptance limit for ethylbenzene. The response of the reporting limit standard was such that the analyte would have been detected even with the low recovery; therefore, the data were accepted.

Date: 30-Apr-02

WorkOrder: 0204457

ANALYTICAL REPORT

Client Sample ID: 4598-MW1-W

Received: 4/18/02

Collected: 4/16/02 0:00

Lab ID: 0204457-01A

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
Methyl tert-butyl ether (MTBE)	ND	1.0 ✓	µg/L	1.0		4/23/02
Tert-butyl alcohol (TBA)	ND	20	µg/L	1.0		4/23/02
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/23/02
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/23/02
Benzene	ND	0.50 ✓	µg/L	1.0		4/23/02
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		4/23/02
1,2-Dichloroethane	ND	2.0	µg/L	1.0		4/23/02
Toluene	ND	0.50 ✓	µg/L	1.0		4/23/02
1,2-Dibromoethane (EDB)	ND	1.0	µg/L	1.0		4/23/02
Chlorobenzene	ND	1.0	µg/L	1.0		4/23/02
Ethylbenzene	ND	0.50 ✓	µg/L	1.0		4/23/02
m,p-Xylene	ND	0.50 ✓	µg/L	1.0		4/23/02
o-Xylene	ND	0.50 ✓	µg/L	1.0		4/23/02
1,3-Dichlorobenzene	ND	1.0	µg/L	1.0		4/23/02
1,4-Dichlorobenzene	ND	1.0	µg/L	1.0		4/23/02
1,2-Dichlorobenzene	ND	1.0	µg/L	1.0		4/23/02
Surrogate: 1,4-Dichlorobenzene-d4	78.8	70-130	% Rec	1.0		4/23/02

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gasoline	110	50	µg/L	1.0		4/23/02

Client Sample ID: 4598-MW1-W

Received: 4/18/02

Collected: 4/16/02 0:00

Lab ID: 0204457-01D

Test Name: TPH as Diesel/Motor Oil

Reference: EPA 3510/GCFID

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Diesel	ND	50	µg/L	1.0	4/19/02	4/22/02
TPHC Motor Oil	ND	170	µg/L	1.0	4/19/02	4/22/02

Date: 30-Apr-02

WorkOrder: 0204457

ANALYTICAL REPORT

Client Sample ID: 4598-MW2-W

Received: 4/18/02

Collected: 4/16/02 0:00

Lab ID: 0204457-02A

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		4/24/02
Tert-butyl alcohol (TBA)	ND	20	µg/L	1.0		4/24/02
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/24/02
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/24/02
Benzene	ND	0.50	µg/L	1.0		4/24/02
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		4/24/02
1,2-Dichloroethane	ND	2.0	µg/L	1.0		4/24/02
Toluene	ND	0.50	µg/L	1.0		4/24/02
1,2-Dibromoethane (EDB)	ND	1.0	µg/L	1.0		4/24/02
Chlorobenzene	ND	1.0	µg/L	1.0		4/24/02
Ethylbenzene	ND	0.50	µg/L	1.0		4/24/02
m,p-Xylene	ND	1.0	µg/L	1.0		4/24/02
o-Xylene	ND	0.50	µg/L	1.0		4/24/02
1,3-Dichlorobenzene	ND	1.0	µg/L	1.0		4/24/02
1,4-Dichlorobenzene	ND	1.0	µg/L	1.0		4/24/02
1,2-Dichlorobenzene	ND	1.0	µg/L	1.0		4/24/02
Surrogate: 1,4-Dichlorobenzene-d4	83.2	70-130	% Rec	1.0		4/24/02

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gasoline	ND	50	µg/L	1.0		4/24/02

Client Sample ID: 4598-MW2-W

Received: 4/18/02

Collected: 4/16/02 0:00

Lab ID: 0204457-02D

Test Name: TPH as Diesel/Motor Oil

Reference: EPA 3510/GCFID

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Diesel	ND	50	µg/L	1.0	4/19/02	4/22/02
TPHC Motor Oil	ND	170	µg/L	1.0	4/19/02	4/22/02

Date: 30-Apr-02

WorkOrder: 0204457

ANALYTICAL REPORT

Client Sample ID: 4598-MW3-W

Received: 4/18/02

Collected: 4/16/02 0:00

Lab ID: 0204457-03A

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		4/24/02
Tert-butyl alcohol (TBA)	ND	20	µg/L	1.0		4/24/02
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/24/02
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/24/02
Benzene	ND	0.50	µg/L	1.0		4/24/02
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		4/24/02
1,2-Dichloroethane	ND	2.0	µg/L	1.0		4/24/02
Toluene	ND	0.50	µg/L	1.0		4/24/02
1,2-Dibromoethane (EDB)	ND	1.0	µg/L	1.0		4/24/02
Chlorobenzene	ND	1.0	µg/L	1.0		4/24/02
Ethylbenzene	ND	0.50	µg/L	1.0		4/24/02
m,p-Xylene	ND	0.50	µg/L	1.0		4/24/02
o-Xylene	ND	0.50	µg/L	1.0		4/24/02
1,3-Dichlorobenzene	ND	1.0	µg/L	1.0		4/24/02
1,4-Dichlorobenzene	ND	1.0	µg/L	1.0		4/24/02
1,2-Dichlorobenzene	ND	1.0	µg/L	1.0		4/24/02
Surrogate: 1,4-Dichlorobenzene-d4	79.3	70-130	% Rec	1.0		4/24/02

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gasoline	220	50	µg/L	1.0		4/24/02

Client Sample ID: 4598-MW3-W

Received: 4/18/02

Collected: 4/16/02 0:00

Lab ID: 0204457-03D

Test Name: TPH as Diesel/Motor Oil

Reference: EPA 3510/GCFID

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Diesel	ND	50	µg/L	1.0	4/19/02	4/22/02
TPHC Motor Oil	ND	170	µg/L	1.0	4/19/02	4/22/02

Date: 30-Apr-02

WorkOrder: 0204457

ANALYTICAL REPORT

Client Sample ID: 4598-QCTB-W

Received: 4/18/02

Collected: 4/16/02 0:00

Lab ID: 0204457-04A

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		4/23/02
Tert-butyl alcohol (TBA)	ND	20	µg/L	1.0		4/23/02
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/23/02
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/23/02
Benzene	ND	0.50	µg/L	1.0		4/23/02
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		4/23/02
1,2-Dichloroethane	ND	2.0	µg/L	1.0		4/23/02
Toluene	ND	0.50	µg/L	1.0		4/23/02
1,2-Dibromoethane (EDB)	ND	1.0	µg/L	1.0		4/23/02
Chlorobenzene	ND	1.0	µg/L	1.0		4/23/02
Ethylbenzene	ND	0.50	µg/L	1.0		4/23/02
m,p-Xylene	ND	0.50	µg/L	1.0		4/23/02
o-Xylene	ND	0.50	µg/L	1.0		4/23/02
1,3-Dichlorobenzene	ND	1.0	µg/L	1.0		4/23/02
1,4-Dichlorobenzene	ND	1.0	µg/L	1.0		4/23/02
1,2-Dichlorobenzene	ND	1.0	µg/L	1.0		4/23/02
Surrogate: 1,4-Dichlorobenzene-d4	81.2	70-130	% Rec	1.0		4/23/02

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gasoline	ND	50	µg/L	1.0		4/23/02

Date: 30-Apr-02

WorkOrder: 0204457

ANALYTICAL REPORT

Client Sample ID: 4598-QCFD-W

Received: 4/18/02

Collected: 4/16/02 0:00

Lab ID: 0204457-05A

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		4/24/02
Tert-butyl alcohol (TBA)	ND	20	µg/L	1.0		4/24/02
Di-Isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/24/02
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/24/02
Benzene	ND	0.50	µg/L	1.0		4/24/02
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		4/24/02
1,2-Dichloroethane	ND	2.0	µg/L	1.0		4/24/02
Toluene	ND	0.50	µg/L	1.0		4/24/02
1,2-Dibromoethane (EDB)	ND	1.0	µg/L	1.0		4/24/02
Chlorobenzene	ND	1.0	µg/L	1.0		4/24/02
Ethylbenzene	ND	0.50	µg/L	1.0		4/24/02
m,p-Xylene	ND	0.50	µg/L	1.0		4/24/02
o-Xylene	ND	0.50	µg/L	1.0		4/24/02
1,3-Dichlorobenzene	ND	1.0	µg/L	1.0		4/24/02
1,4-Dichlorobenzene	ND	1.0	µg/L	1.0		4/24/02
1,2-Dichlorobenzene	ND	1.0	µg/L	1.0		4/24/02
Surrogate: 1,4-Dichlorobenzene-d4	84.3	70-130	% Rec	1.0		4/24/02

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gasoline	220	50	µg/L	1.0		4/24/02

Date: 30-Apr-02

WorkOrder: 0204457

ANALYTICAL REPORT

Client Sample ID: 4598-QCMB-W

Received: 4/18/02

Collected: 4/16/02 0:00

Lab ID: 0204457-06A

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		4/23/02
Tert-butyl alcohol (TBA)	ND	20	µg/L	1.0		4/23/02
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/23/02
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/23/02
Benzene	ND	0.50	µg/L	1.0		4/23/02
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		4/23/02
1,2-Dichloroethane	ND	2.0	µg/L	1.0		4/23/02
Toluene	ND	0.50	µg/L	1.0		4/23/02
1,2-Dibromoethane (EDB)	ND	1.0	µg/L	1.0		4/23/02
Chlorobenzene	ND	1.0	µg/L	1.0		4/23/02
Ethylbenzene	ND	0.50	µg/L	1.0		4/23/02
m,p-Xylene	ND	0.50	µg/L	1.0		4/23/02
o-Xylene	ND	0.50	µg/L	1.0		4/23/02
1,3-Dichlorobenzene	ND	1.0	µg/L	1.0		4/23/02
1,4-Dichlorobenzene	ND	1.0	µg/L	1.0		4/23/02
1,2-Dichlorobenzene	ND	1.0	µg/L	1.0		4/23/02
Surrogate: 1,4-Dichlorobenzene-d4	80.5	70-130	% Rec	1.0		4/23/02

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Mod

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gasoline	ND	50	µg/L	1.0		4/23/02

North Coast Laboratories, Ltd.

Date: 30-Apr-02

CLIENT: One Stop Shop
 Work Order: 0204457
 Project: 4598.01, Walsh Oil/One Stop Shop

QC SUMMARY REPORT

Method Blank

Sample ID	MB-042302	Batch ID: R16493	Test Code: 8260OXYW	Units: µg/L	Analysis Date	4/23/02 8:57:00 PM	Prep Date				
Client ID:		Run ID:	ORGCMS2_020423A	SeqNo:	243835						
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	1.0									
Tert-butyl alcohol (TBA)	ND	20									
Di-isopropyl ether (DIPE)	ND	1.0									
Ethyl tert-butyl ether (ETBE)	ND	1.0									
Benzene	0.06294	0.50									J
Tert-amyl methyl ether (TAME)	ND	1.0									
1,2-Dichloroethane	ND	2.0									
Toluene	0.08267	0.50									J
1,2-Dibromoethane (EDB)	ND	1.0									
Chlorobenzene	ND	1.0									
Ethylbenzene	0.2191	0.50									J
m,p-Xylene	ND	0.50									
o-Xylene	0.1711	0.50									J
1,3-Dichlorobenzene	ND	1.0									
1,4-Dichlorobenzene	ND	1.0									
1,2-Dichlorobenzene	0.2513	1.0									J
1,4-Dichlorobenzene-d4	0.815	0.10	1.00	0	81.5%	70	130	0			

Sample ID	MB-042302	Batch ID: R16496	Test Code: GASW-MS	Units: µg/L	Analysis Date	4/23/02 8:57:00 PM	Prep Date				
Client ID:		Run ID:	ORGCMS2_020423B	SeqNo:	243896						
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	26.72	50									J

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

CLIENT: One Stop Shop
Work Order: 0204457
Project: 4598.01, Walsh Oil/One Stop Shop

QC SUMMARY REPORT

Method Blank

Sample ID MB-6255 **Batch ID:** 6255 **Test Code:** TPHDMW **Units:** µg/L **Analysis Date** 4/22/02 3:04:44 PM **Prep Date** 4/19/02
Client ID: **Run ID:** ORGC5_020422A **SeqNo:** 243125

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel	ND	50									
TPHC Motor Oil	ND	170									

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

North Coast Laboratories, Ltd.

Date: 30-Apr-02

CLIENT: One Stop Shop

Work Order: 0204457

Project: 4598.01, Walsh Oil/One Stop Shop

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID	LC SOXY02071	Batch ID: R18493	Test Code: 8260OXYW	Units: µg/L	Analysis Date	4/23/02 6:10:00 PM	Prep Date				
Client ID:		Run ID:	ORGCMS2_020423A		SeqNo:	243833					
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	25.31	1.0	20.0	0	127%	93	142	0			
Tert-butyl alcohol (TBA)	409.4	20	400	0	102%	45	313	0			
Di-isopropyl ether (DIPE)	23.32	1.0	20.0	0	117%	89	125	0			
Ethyl tert-butyl ether (ETBE)	23.25	1.0	20.0	0	116%	94	133	0			
Benzene	11.07	0.50	10.0	0	111%	65	127	0			
Tert-amyl methyl ether (TAME)	22.27	1.0	20.0	0	111%	93	128	0			
1,2-Dichloroethane	24.39	2.0	20.0	0	122%	56	210	0			
Toluene	9.466	0.50	10.0	0	94.7%	79	115	0			
1,2-Dibromoethane (EDB)	18.12	1.0	20.0	0	90.6%	76	140	0			
Chlorobenzene	18.65	1.0	20.0	0	93.2%	82	120	0			
Ethylbenzene	9.165	0.50	10.0	0	91.7%	89	119	0			
m,p-Xylene	19.06	0.50	20.0	0	95.3%	85	121	0			
o-Xylene	9.679	0.50	10.0	0	96.8%	78	131	0			
1,3-Dichlorobenzene	19.23	1.0	20.0	0	96.2%	50	170	0			
1,4-Dichlorobenzene	18.38	1.0	20.0	0	91.9%	58	162	0			
1,2-Dichlorobenzene	17.70	1.0	20.0	0	88.5%	49	175	0			
1,4-Dichlorobenzene-d4	0.989	0.10	1.00	0	98.9%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: One Stop Shop
Work Order: 0204457
Project: 4598.01, Walsh Oil/One Stop Shop

QC SUMMARY REPORT
 Laboratory Control Spike Duplicate

Sample ID: LCSDOXY02071 Batch ID: R16493 Test Code: 8260XYW Units: µg/L Analysis Date: 4/23/02 6:43:00 PM Prep Date:
 Client ID: Run ID: ORGCMS2_020423A SeqNo: 243834

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	23.17	1.0	20.0	0	116%	93	142	25.3	8.83%	20	
Tert-butyl alcohol (TBA)	498.7	20	400	0	125%	45	313	409	19.7%	20	
Di-isopropyl ether (DIPE)	21.59	1.0	20.0	0	108%	89	125	23.3	7.71%	20	
Ethyl tert-butyl ether (ETBE)	21.84	1.0	20.0	0	109%	94	133	23.2	6.26%	20	
Benzene	10.29	0.50	10.0	0	103%	65	127	11.1	7.28%	20	
Tert-amyl methyl ether (TAME)	21.40	1.0	20.0	0	107%	93	128	22.3	3.97%	20	
1,2-Dichloroethane	24.80	2.0	20.0	0	124%	56	210	24.4	1.69%	20	
Toluene	9.059	0.50	10.0	0	90.7%	79	115	9.47	4.28%	20	
1,2-Dibromoethane (EDB)	18.48	1.0	20.0	0	92.4%	76	140	18.1	1.98%	20	
Chlorobenzene	18.18	1.0	20.0	0	90.9%	82	120	18.6	2.55%	20	
Ethylbenzene	8.724	0.50	10.0	0	87.2%	89	119	9.16	4.93%	20	S
m,p-Xylene	18.59	0.50	20.0	0	93.0%	85	121	19.1	2.50%	20	
o-Xylene	9.100	0.50	10.0	0	91.0%	78	131	9.68	6.16%	20	
1,3-Dichlorobenzene	17.97	1.0	20.0	0	89.9%	50	170	19.2	6.76%	20	
1,4-Dichlorobenzene	18.27	1.0	20.0	0	91.4%	58	162	18.4	0.593%	20	
1,2-Dichlorobenzene	17.46	1.0	20.0	0	87.3%	49	175	17.7	1.39%	20	
1,4-Dichlorobenzene-d4	0.980	0.10	1.00	0	98.0%	70	130	0.989	0.888%	20	

Sample ID	LCSGAS02072	Batch ID	R16496	Test Code	GASW-MS	Units	µg/L	Analysis Date	4/23/02 7:16:00 PM	Prep Date	
Client ID		Run ID		ORGCMS2_020423B				SeqNo:	243894		
Analyte		Result		Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	RPDLimit
TPHC Gasoline		1,088		50	1,000	0	109%	80	120	0	Qual

Sample ID: LCSDGAS02072	Batch ID: R16496	Test Code: GASW-MS		Units: µg/L	Analysis Date 4/23/02 7:50:00 PM		Prep Date				
Client ID:		Run ID: ORGCMS2_020423B			SeqNo: 243895						
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	1,057	50	1,000	0	106%	80	120	1,090	2.95%	20	

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: One Stop Shop
Work Order: 0204457
Project: 4598.01, Walsh Oil/One Stop Shop

QC SUMMARY REPORT Laboratory Control Spike

Sample ID: LCS-6255 **Batch ID:** 6255 **Test Code:** TPHDMW **Units:** µg/L **Analysis Date:** 4/22/02 12:28:24 PM **Prep Date:** 4/19/02
Client ID: **Run ID:** ORGC5_020422A **SeqNo:** 243122

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel	445.7	50	500	0	89.1%	66	129	0			
TPHC Motor Oil	905.3	170	1,000	0	90.5%	70	148	0			

Sample ID: LCSD-6255 **Batch ID:** 6255 **Test Code:** TPHDMW **Units:** µg/L **Analysis Date:** 4/22/02 12:59:32 PM **Prep Date:** 4/19/02
Client ID: **Run ID:** ORGC5_020422A **SeqNo:** 243123

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel	448.5	50	500	0	89.7%	66	129	446	0.642%	20	
TPHC Motor Oil	907.3	170	1,000	0	90.7%	70	148	905	0.227%	20	

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits



5680 West End Road • Arcata • CA 95521-9202
707-822-4649 Fax 707-822-6831

Chain of Custody

of
a.

LABORATORY NUMBER:

23

PROJECT INFORMATION

Project Number: 108654
Project Name: WALSH ON FORT STOP SHOP
Purchase Order Number:

[illegible][illegible]

SAMPLE CONDITION/SPECIAL INSTRUCTIONS

Hand of Person + Name: MW1
" MW2
" MW3
" QCTB
" QCTD
" QCMB

old contact

SAMPLE DISPOSAL

☐ NCL Disposal of Non-Contaminated
☒ ~~NCL~~ Disposal of Contaminated
☐ Return ☐ Pickup

CHAIN OF CUSTODY SEALS Y/N/NA ☐ SHIPPED VIA: UPS Air-Ex Fed-Ex Bus Hand-

***MATRIX:** DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT

APPENDIX D

FILE REVIEW DOCUMENTS

***QUARTERLY MONITORING REPORT, SECOND QUARTER 2002, FORMER
BEACON STATION NO. 3493***





HORIZON ENVIRONMENTAL INC.

Specialists In Site Assessment, Remedial Testing, Design and Operation

R W Q C B
REGION 1

AUG 26 2002

August 22, 2002

<input type="checkbox"/> SAW	<input type="checkbox"/> FCR	<input checked="" type="checkbox"/> DLW
<input type="checkbox"/> RLT	<input checked="" type="checkbox"/> LGR	<input type="checkbox"/> KAD
<input type="checkbox"/> NPO	<input type="checkbox"/> RSG	<input type="checkbox"/> EJJ

Mr. Daniel L. Warner, Environmental Specialist II
California Regional Water Quality Control Board
- North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

Subject: **Transmittal of Quarterly Groundwater Monitoring Report**
Second Quarter - 2002
Former Beacon Station No. 3493
210 South Main Street, Fort Bragg, California

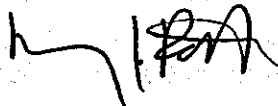
Mr. Warner:

At the request of Ultramar Inc. (Ultramar), Horizon Environmental Inc. (Horizon) is forwarding the enclosed Quarterly Groundwater Monitoring Report dated August 22, 2002 for the above-referenced site.

Please contact Horizon at (916) 939-2170 should you have any questions regarding this report.

Sincerely,

HORIZON ENVIRONMENTAL INC.


Craig J. Roth
Staff Geologist

Enclosure

c: Mr. Joe Aldridge, Ultramar Inc.



HORIZON ENVIRONMENTAL INC.

Specialists in Site Assessment, Remedial Testing, Design and Operation

August 22, 2002

Mr. Joe Aldridge
Ultramar Inc.
685 West Third Street
Hanford, California 93230

Subject: **Quarterly Groundwater Monitoring Report**
Second Quarter - 2002
Former Beacon Station No. 3493
210 South Main Street, Fort Bragg, California

Mr. Aldridge:

Horizon Environmental Inc. (Horizon) has prepared this Quarterly Groundwater Monitoring Report which presents results of the second quarter 2002 groundwater monitoring and sampling for the above-referenced site (Figure 1). There are currently five onsite monitoring locations and four offsite groundwater monitoring wells (MW-3, MW-4, MW-5 and MW-6). Two of the onsite locations are temporary wells marked as East and West (wells MW-E and MW-W), and the other three locations are vertical PVC casings (A, B and C) installed within a recovery trench along the western site boundary (Figure 2).

Horizon previously performed sampling, operation and maintenance of a groundwater treatment system (GWTS) at the site. The GWTS had consisted of one submersible pump installed in casing C located in the onsite recovery trench. The extracted groundwater was routed through three 200-pound liquid-phase carbon vessels in series. The treated groundwater was then discharged to the sanitary sewer under the authority of the City of Fort Bragg, Department of Public Works, Sanitary Code. The GWTS was shut down in October 1999 due to consistently low or no concentrations of hydrocarbons in the groundwater being extracted and treated. The GWTS equipment was subsequently removed from the site.

Groundwater Monitoring

Doulos Environmental Company (Doulos) obtained depth-to-groundwater measurements from the nine monitoring locations on June 25, 2002 (see Table 1). Static groundwater levels were measured from the top-of-casing (T.O.C.) of each well and recorded to the nearest 0.01-foot. Water level measurements were subtracted from Global Positioning System (GPS) TOC elevations to obtain water elevations, as listed in Table 1. Ultramar Inc. (Ultramar) Field Procedures are presented as Attachment A with this report, and Doulos Field Data Sheets are included as Attachment B. Historical groundwater data as reported by previous consultants is included as Attachment D.

Groundwater samples were collected from the six monitoring wells on June 25, 2002 (see Table 1). Collected water samples were submitted under Chain-of-Custody to Kiff Analytical, a California Department of Health Services-certified analytical laboratory (ELAP Certification No. 2236) located in Davis, California. Groundwater samples were analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg), the volatile aromatics benzene, toluene, ethylbenzene, and total xylenes (BTEX), and the fuel oxygenate methyl tert-butyl ether (MTBE) utilizing Environmental Protection Agency Method 8260B. The laboratory results are also summarized in Table 1. Copies of the laboratory reports and Chain-of-Custody are included as Attachment C.

Results

Water-level data collected by Doulos on June 25, 2002 was used to construct the Groundwater Contour Map (Figure 2). The flow direction was to the southwest at an average rate of 0.02 foot / foot beneath the site area. Groundwater monitoring previously performed has indicated a similar groundwater flow direction beneath the site since 1998. No concentrations of benzene were detected in any of the wells monitored, therefore, a Benzene Isoconcentration Map was not constructed for this quarterly report.

Because no concentrations of dissolved TPHg, BTEX and MTBE have been reported at the site since June 2001 (one hydrologic cycle), Horizon continues to recommend that the site be granted Closure status by the North Coast RWQCB.

Report Distribution

We recommend a copy of this report be forwarded to:

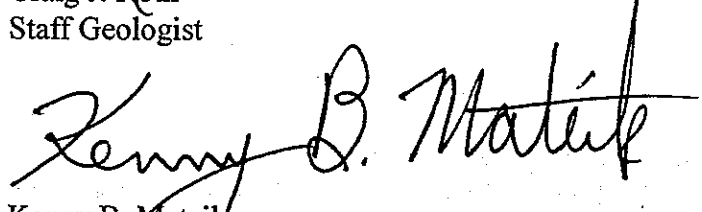
Mr. Daniel L. Warner, Environmental Specialist II
CRWQCB - North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

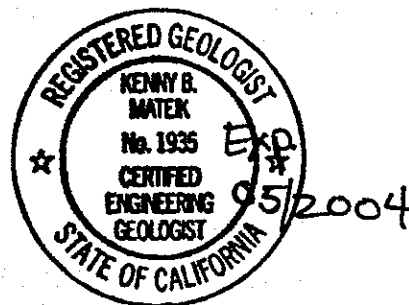
If you have any questions, please contact Horizon at (916) 939-2170.

Sincerely,

HORIZON ENVIRONMENTAL INC.


Craig J. Roth
Staff Geologist


Kenny B. Mateik
Registered Geologist, C.E.G. No. 1935

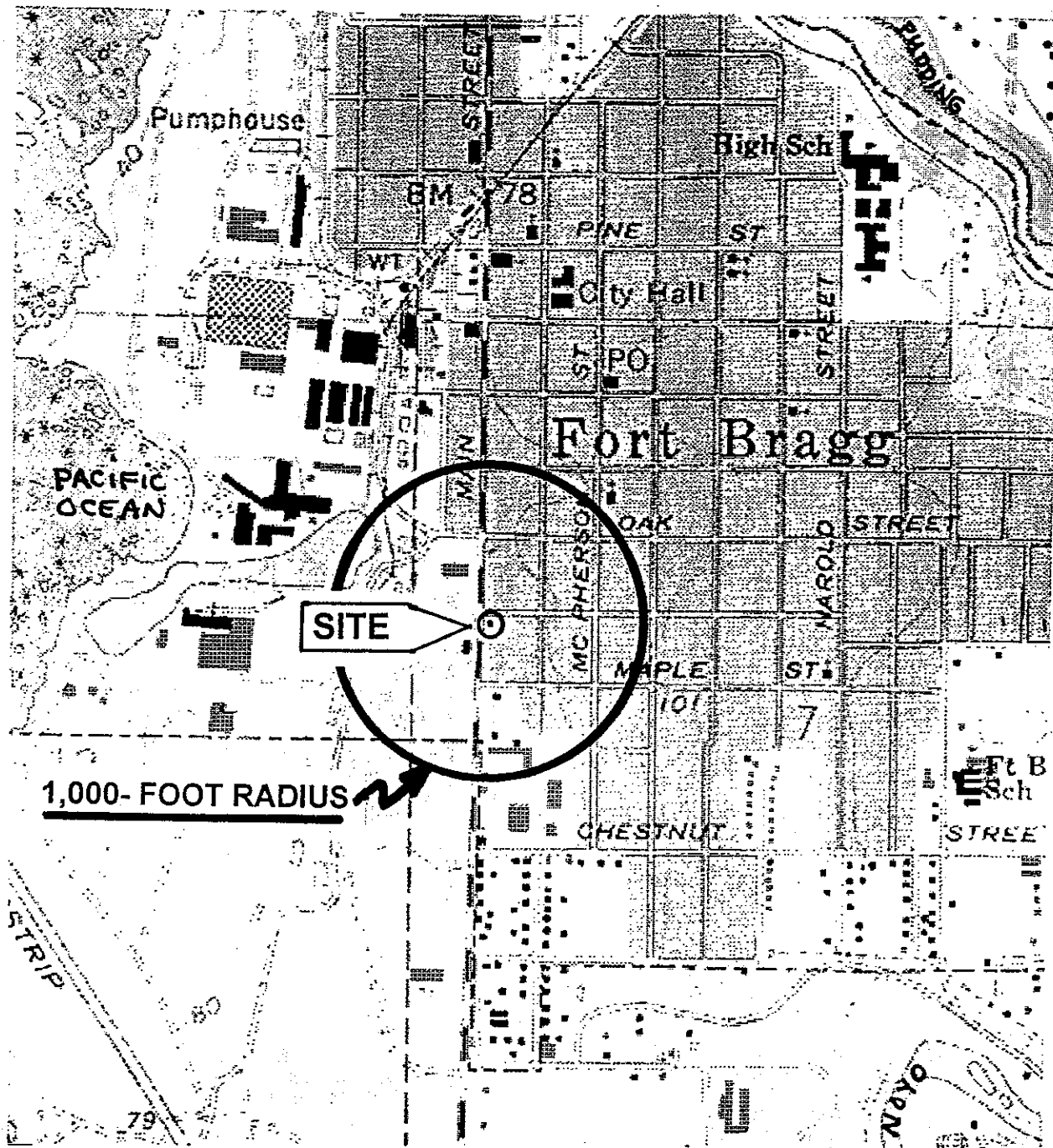


Attachments:

Figure 1: Site Vicinity Map
Figure 2: Site Plan / Groundwater Contour Map

Table 1: Groundwater Monitoring Data

Attachment A: Ultramar Field Procedures
Attachment B: Doulos Field Data Sheets
Attachment C: Laboratory Data and Chain-of-Custody Reports
Attachment D: Historical Groundwater Data



Source: U.S.G.S. 7-1/2 Minute Topographic Map Fort Bragg
Quadrangle, California 1960 Photorevised 1978

0 1,000 2,000
Approximate Scale In Feet



HORIZON ENVIRONMENTAL INC.

Project Number: 1493.14
Prepared By: K. Mateik
Reviewed By: G. Barker

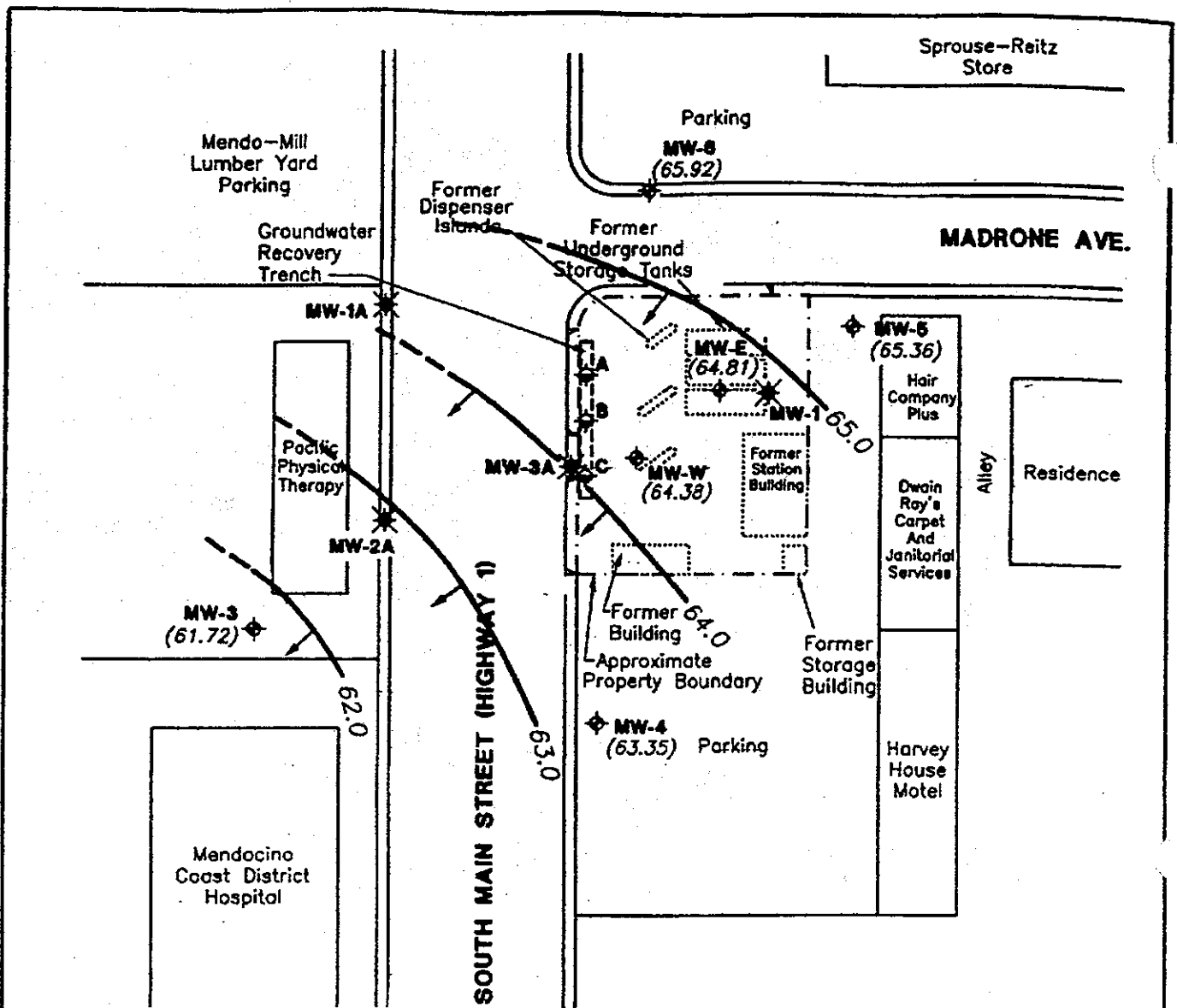
Drawn By: D. Auble
Date: 03/02
Revised Date:

SITE VICINITY MAP

FORMER BEACON STATION NO. 3493
210 SOUTH MAIN STREET
FORT BRAGG, CALIFORNIA

FIGURE

1



EXPLANATION:

- MW-8** ♦ Groundwater Monitoring Well
- MW-3A** ✱ Abandoned Groundwater Monitoring Well
- C** ♦ Groundwater Recovery Trench Riser Pipe
- (65.92)** Elevation Of Groundwater Measured In Feet; Datum Is Mean Sea Level

- 65.0** — Line Of Equal Elevation Of Groundwater Measured In Feet; Datum Is Mean Sea Level
- ↙ Direction Of Groundwater Flow

Wells Measured 06/25/02



0 60

Approximate Scale In Feet

Source: Figure Modified From Drawing
Provided By El Dorado Environmental, Inc..



HORIZON ENVIRONMENTAL INC.

Project Number: 1493.
Prepared By: C. Roth
Reviewed By: K. Mateik

Drawn By: D. Alston/C.B.
Date: 08/02
Revised Date:

**SITE PLAN/
GROUNDWATER CONTOUR MAP**

BEACON STATION NO. 493
210 SOUTH MAIN STREET
FORT BRAGG, CALIFORNIA

FIGURE

2

Groundwater Monitoring Data
Former Beacon Station No. 3493
210 South Main Street, Fort Bragg, California

Well Number	Date	TPHg ppb	Benzene ppb	Toluene ppb	Ethylbenz. ppb	Xylenes ppb	MTBE ppb	Depth to GW	T.O.C. Elevation	GW Elevation	Comments
MW-1A	01/30/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.09	64.60	61.51	slight odor / no sheen
	06/09/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.86		59.74	slight odor / no sheen
	09/26/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.15		58.65	slight odor / no sheen
	12/31/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.25		59.35	slight odor / no sheen
	01/14/99							NA		NA	overdrill
MW-2A	01/30/98	52	2.0	<0.50	<0.50	<0.50	<5.0	2.89	64.33	61.44	slight odor / no sheen
	06/09/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.73		59.60	slight odor / no sheen
	09/26/98	<50	0.73	<0.50	<0.50	<0.50	<5.0	6.18		58.15	slight odor / no sheen
	12/31/98	<50	2.4	<0.50	<0.50	<0.50	<5.0	5.24		59.09	slight odor / no sheen
	01/14/99							NA		NA	overdrill
MW-3	01/30/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	2.88	64.04	61.16	no odor / no sheen
	06/09/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.49		59.55	no odor / no sheen
	09/26/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.00		58.04	no odor / no sheen
	12/31/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.04		59.00	no odor / no sheen
	03/26/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.30		60.74	no comment
	06/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.10		58.94	no odor / no sheen
	09/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.88		58.16	no comment
	12/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.69		59.35	no odor / no sheen
	03/30/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.94		60.10	no odor / no sheen
	06/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.74		59.30	no comment
	09/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.68		58.36	no comment
	12/05/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.64		58.40	no comment
	03/27/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.16		59.88	no comment
	06/29/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.90		59.14	no comment
	09/25/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.15		57.89	no comment
	12/27/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.70		60.34	no comment
	04/01/02	-----	-----	-----	-----	-----	-----		67.13		GPS surveying of well
	03/27/02	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.97		63.16	no comment
	06/25/02	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.41		61.72	no comment
MW-3A	01/30/98	22,000	2,100	240	2,100	3,700	2,000	2.36	65.23	62.87	petroleum odor / no sheen
	06/09/98	16,000	700	67	930	1,700	390	4.70		60.53	petroleum odor / no sheen
	09/26/98	930	62	3.3	51	38	53	5.95		59.28	petroleum odor / no sheen
	12/31/98	5,800	330	51	720	1,200	350	5.01		60.22	petroleum odor / no sheen
	01/14/99							NA		NA	overdrill

Table 1
Groundwater Monitoring Data
Former Beacon Station No. 3493
210 South Main Street, Fort Bragg, California

Well Number	Date	TPHg ppb	Benzene ppb	Toluene ppb	Ethylbenz. ppb	Xylenes ppb	MTBE ppb	Depth to GW	T.O.C. Elevation	GW Elevation	Comments
MW-4	01/30/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	2.35	65.82	63.47	no odor / no sheen
	06/09/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.37		61.45	no odor / no sheen
	09/26/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.24		59.58	no odor / no sheen
	12/31/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.99		60.83	no odor / no sheen
	03/26/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.13		62.69	no comment
	06/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.21		60.61	no odor / no sheen
	09/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.02		59.80	no comment
	12/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.61		61.21	no odor / no sheen
	03/30/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.52		62.30	no odor / no sheen
	06/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.71		61.11	no comment
	09/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.93		59.89	no comment
	12/05/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.84		59.98	no comment
	03/27/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.73		62.09	no comment
	06/29/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.95		60.87	no comment
	09/25/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	6.41		59.41	no comment
	12/27/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.42		62.40	no comment
	04/01/02	-----	-----	-----	-----	-----	-----		68.87		GPS surveying of well
	03/27/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.80		65.07	no comment
	06/25/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.52		63.35	no comment
MW-5	01/30/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.33	68.18	64.85	no odor / no sheen
	06/09/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.84		63.34	no odor / no sheen
	09/26/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.46		61.72	no odor / no sheen
	12/31/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.25		62.93	no odor / no sheen
	03/26/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.47		64.71	no comment
	06/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.44		62.74	no odor / no sheen
	09/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.45		61.73	no comment
	12/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.05		63.13	no odor / no sheen
	03/30/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.99		64.19	no odor / no sheen
	06/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.20		62.98	no comment
	09/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.47		61.71	no comment
	12/05/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.40		61.78	no comment
	03/27/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.22		63.96	no comment
	06/29/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.57		62.61	no comment
	09/25/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	6.81		61.37	no comment
	12/27/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.62		64.56	no comment
	04/01/02	-----	-----	-----	-----	-----	-----		71.27		GPS surveying of well
	03/27/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.24		67.03	no comment
	06/25/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.91		65.36	no comment

Groundwater Monitoring Data
Former Beacon Station No. 3493
210 South Main Street, Fort Bragg, California

Well Number	Date	TPHg ppb	Benzene ppb	Toluene ppb	Ethylbenz. ppb	Xylenes ppb	MTBE ppb	Depth to GW	T.O.C. Elevation	GW Elevation	Comments
MW-6	01/30/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	0.51	66.81	66.30	no odor / no sheen
	06/09/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	2.73		64.08	no odor / no sheen
	09/26/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.15		62.66	no odor / no sheen
	12/31/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.06		63.75	no odor / no sheen
	03/26/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	1.32		65.49	no comment
	06/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.56		63.25	no odor / no sheen
	09/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.36		62.45	no comment
	12/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.07		63.74	no odor / no sheen
	03/30/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	2.28		64.53	no odor / no sheen
	06/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.38		63.43	no comment
	09/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.39		62.42	no comment
	12/05/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.36		62.45	no comment
	03/27/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.50		64.31	no comment
	06/29/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.69		63.12	no comment
	09/25/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.61		62.20	no comment
	12/27/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.05		64.76	no comment
	04/01/02	-----	-----	-----	-----	-----	-----		69.92		GPS surveying of well
	03/27/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.59		67.33	no comment
	06/25/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.00		65.92	no comment
MW-A (trench casing - north)	12/02/98								NM	NM	Trench construction complete
	12/31/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.54			slight odor/ no sheen
	03/26/99	55	<0.50	<0.50	0.65	<0.50	<5.0	6.16			no comment
	06/23/99								67.18		
	06/29/99	na	na	na	na	na	na	6.09		61.09	slight odor/ no sheen
	09/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.67		60.51	no comment
	12/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.16		62.02	slight odor/ no sheen
	03/30/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.41		62.77	no odor / no sheen
	06/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.34		61.84	no comment
	09/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.61		60.57	no comment
	12/05/00	55	<0.50	<0.50	<0.50	4.1	<5.0	6.60		60.58	no comment
	03/27/01	290	<0.50	<0.50	2.3	13	<0.50	4.71		62.47	no comment
	06/29/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.52		61.66	no comment
	09/25/01	ns	ns	ns	ns	ns	ns	6.93		60.25	no comment
	12/27/01	ns	ns	ns	ns	ns	ns	4.39		62.79	no comment
	04/01/02	-----	-----	-----	-----	-----	-----				not resurveyed
	03/27/02	ns	ns	ns	ns	ns	ns	4.74		NC	no comment
	06/25/02	ns	ns	ns	ns	ns	ns	6.11		NC	no comment

Table 1
Groundwater Monitoring Data
Former Beacon Station No. 3493
210 South Main Street, Fort Bragg, California

Well Number	Date	TPHg ppb	Benzene ppb	Toluene ppb	Ethylbenz. ppb	Xylenes ppb	MTBE ppb	Depth to GW	T.O.C. Elevation	GW Elevation	Comments
MW-B (trench casing - center)	12/02/98	96	<0.50	<0.50	<0.50	4.3	<5.0	6.94	NM	NM	Trench construction complete slight odor/ no sheen
	12/31/98	350	1.3	5.4	3.3	81	<5.0	6.65		NM	no comment
	03/26/99										
	06/23/99										
	06/23/99	na	na	na	na	na	na	6.55	67.40	60.85	slight odor/ no sheen
	09/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	7.04		60.36	no comment
	12/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.36		62.04	slight odor/ no sheen
	03/30/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.62		62.78	no odor / no sheen
	06/20/00	<50	<0.50	<0.50	<0.50	0.64	<5.0	5.55		61.85	no comment
	09/20/00	210	1.1	<0.50	8.9	2.1	<5.0	6.99		60.41	no comment
	12/05/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.81		60.59	no odor / no sheen
	03/27/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.91		62.49	no odor / no sheen
	06/29/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.74		61.66	no odor / no sheen
	09/25/01	ns	ns	ns	ns	ns	ns	7.18		60.22	no comment
MW-C (trench casing - south)	12/27/01	ns	ns	ns	ns	ns	ns	4.61		62.79	no comment
	04/01/02	---	---	---	---	---	---				not resurveyed
	03/27/02	ns	ns	ns	ns	ns	ns	4.95		NC	no comment
	06/25/02	ns	ns	ns	ns	ns	ns	6.32		NC	no comment
	12/02/98	150	0.53	1.1	0.97	10	<5.0	6.50	NM	NM	Trench construction complete no odor / no sheen
	12/31/98	670	5.7	6.2	18	130	<5.0	6.81		NM	pump installed
	03/26/99										
	06/23/99										
	06/23/99	100	<0.50	<0.50	0.82	7.7	<5.0	7.10	66.93	59.83	pumping
	09/29/99	60	<0.50	<0.50	0.62	3.8	<5.0	NM		NM	pumping
	12/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.91		62.02	no odor / no sheen
	03/30/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.17		62.76	no odor / no sheen
	06/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.09		61.84	no comment
	09/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.55		60.38	no comment
	12/05/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.35		60.58	no comment
	03/27/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.44		62.49	no comment
	06/29/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.27		61.66	no comment
	09/25/01	ns	ns	ns	ns	ns	ns	7.29		59.64	no comment
	12/27/01	ns	ns	ns	ns	ns	ns	4.13		62.80	not resurveyed
	04/01/02	---	---	---	---	---	---				no comment
	03/27/02	ns	ns	ns	ns	ns	ns	4.48		NC	no comment
	06/25/02	ns	ns	ns	ns	ns	ns	5.88		NC	no comment

Groundwater Monitoring Data
Former Beacon Station No. 3493
210 South Main Street, Fort Bragg, California

Well Number	Date	TPHg ppb	Benzene ppb	Toluene ppb	Ethylbenz. ppb	Xylenes ppb	MTBE ppb	Depth to GW	T.O.C. Elevation	GW Elevation	Comments
MW-E	01/30/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.94	NM	NM	pumping
	06/09/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	10.98		NM	pump off
	09/26/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	7.90		NM	pump off
	12/31/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.90		NM	pump off
	03/26/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.91		NM	pump removed
	06/23/99								68.73		
	06/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.55		62.18	no comment
	09/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	7.60		61.13	no comment
	12/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.09		62.64	no comment
	03/30/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.21		63.52	no odor / no sheen
	06/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.26		62.47	no comment
	09/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	7.57		61.16	no comment
	12/05/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	7.47		61.26	no comment
	03/27/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.38		63.35	no comment
	06/29/01	<50	<0.50	<0.50	<0.50	0.52	2.3	6.48		62.25	no comment
	09/25/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	7.99		60.74	no comment
	12/27/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.86		63.87	no comment
	04/01/02	----	----	----	----	----	----		71.80		GPS surveying of well
	03/27/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.42		66.38	no comment
	06/25/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	6.99		64.81	no comment

Table 1
Groundwater Monitoring Data
Former Beacon Station No. 3493
210 South Main Street, Fort Bragg, California

Well Number	Date	TPHg ppb	Benzene ppb	Toluene ppb	Ethylbenz. ppb	Xylenes ppb	MTBE ppb	Depth to GW	T.O.C. Elevation	GW Elevation	Comments
MW-W	01/30/98	54	1.0	0.62	2.2	5.1	<5.0	5.80	NM	NM	pumping
	06/09/98	700	7.6	2.8	32	67	<5.0	6.52		NM	pumping
	09/26/98	820	16	14	86	100	<5.0	8.98		NM	pumping
	12/31/98	97	2.6	1.0	4.8	9.3	<5.0	12.46		NM	pumping
	06/23/99			WELL SURVEY					66.62		
	06/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.33		61.29	no comment
	09/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.11		60.51	no comment
	12/29/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.45		62.17	no comment
	03/30/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.65		62.97	no odor / no sheen
	06/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.61		62.01	no comment
	09/20/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.98		60.64	no comment
	12/05/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.85		60.77	no comment
	03/27/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.87		62.75	no comment
	06/29/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	4.80		61.82	no comment
	09/25/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.35		60.27	no comment
	12/27/01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.44		63.18	no comment
	04/01/02								69.70		GPS surveying of well
	03/27/02	<50	<0.50	<0.50	<0.50	<0.50	<5.0	3.86		65.84	no comment
	06/25/02	<50	<0.50	<0.50	<0.50	<0.50	<5.0	5.32		64.38	no comment

Notes:

TPHg = Total Petroleum Hydrocarbons as gasoline
MTBE = Methyl Tertiary-Butyl Ether
All analytical results reported in parts per billion (ppb)

Depths and Elevations recorded in feet.
T.O.C. = Top of casing
GW = Groundwater

NM = Not Measured
NA = Not Applicable
na = not analyzed
ns = not sampled

ATTACHMENT C

LABORATORY DATA SHEETS AND

CHAIN OF CUSTODY REPORTS



Report Number : 27219

Date : 7/8/02

~~1493.43~~
1493.43

Ken Mateik
Horizon Environmental
5011 Golden Foothill Pkwy., Suite 7
El Dorado Hills, CA 95762

Subject : 6 Water Samples
Project Name : 3493 Fort Bragg
Project Number :
P.O. Number : 3493-53

Dear Mr. Mateik,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,


Joel Kiff



Report Number : 27219

Date : 7/8/02

Project Name : 3493 Fort Bragg

Project Number :

Sample : MW-3

Matrix : Water

Lab Number : 27219-01

Sample Date :6/25/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Toluene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	7/2/02
Toluene - d8 (Surr)	92.7		% Recovery	EPA 8260B	7/2/02
4-Bromofluorobenzene (Surr)	103		% Recovery	EPA 8260B	7/2/02

Sample : MW-4

Matrix : Water

Lab Number : 27219-02

Sample Date :6/25/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Toluene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	7/2/02
Toluene - d8 (Surr)	93.0		% Recovery	EPA 8260B	7/2/02
4-Bromofluorobenzene (Surr)	100		% Recovery	EPA 8260B	7/2/02

Approved By: Joel Kiff



Report Number : 27219

Date : 7/8/02

Project Name : 3493 Fort Bragg

Project Number :

Sample : MW-5

Matrix : Water

Lab Number : 27219-03

Sample Date :6/25/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Toluene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	7/2/02
Toluene - d8 (Surr)	94.4		% Recovery	EPA 8260B	7/2/02
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	7/2/02

Sample : MW-6

Matrix : Water

Lab Number : 27219-04

Sample Date :6/25/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Toluene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	7/2/02
Toluene - d8 (Surr)	93.1		% Recovery	EPA 8260B	7/2/02
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	7/2/02

Approved By:  Joel Kiff



Report Number : 27219

Date : 7/8/02

Project Name : 3493 Fort Bragg

Project Number :

Sample : MW-E

Matrix : Water

Lab Number : 27219-05

Sample Date :6/25/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Toluene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	7/2/02
Toluene - d8 (Surr)	92.3		% Recovery	EPA 8260B	7/2/02
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	7/2/02

Sample : MW-W

Matrix : Water

Lab Number : 27219-06

Sample Date :6/25/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Toluene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	7/2/02
Toluene - d8 (Surr)	93.2		% Recovery	EPA 8260B	7/2/02
4-Bromofluorobenzene (Surr)	100		% Recovery	EPA 8260B	7/2/02

Approved By: Joel Kiff

QC Report : Method Blank Data

Project Name : 3493 Fort Bragg

Project Number :

Report Number : 27219

Date : 7/8/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Toluene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
Methyl- <i>t</i> -butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	7/2/02
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	7/2/02
Toluene - d8 (Surr)	91.4		%	EPA 8260B	7/2/02
4-Bromofluorobenzene (Surr)	99.1		%	EPA 8260B	7/2/02

KIFF ANALYTICAL, LLC
720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Approved By: Joel Kiff

Joel Kiff

Report Number : 27219
Date : 7/8/02

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **3493 Fort Bragg**

Project Number :

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	27245-03	1.1	40.0	40.0	42.4	43.2	ug/L	EPA 8260B	7/2/02	103	105	2.09	70-130	25
Toluene	27245-03	12	40.0	40.0	49.2	48.6	ug/L	EPA 8260B	7/2/02	92.2	90.8	1.53	70-130	25
Tert-Butanol	27245-03	11	200	200	202	190	ug/L	EPA 8260B	7/2/02	95.3	89.4	6.41	70-130	25
Methyl-t-Butyl Ether	27245-03	<0.50	40.0	40.0	35.6	33.4	ug/L	EPA 8260B	7/2/02	88.9	83.4	6.44	70-130	25

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Approved By: *Joel Kiff*

Report Number : 27219

Date : 7/8/02

QC Report : Laboratory Control Sample (LCS)

Project Name : **3493 Fort Bragg**

Project Number :

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	7/2/02	106	70-130
Toluene	40.0	ug/L	EPA 8260B	7/2/02	97.7	70-130
Tert-Butanol	200	ug/L	EPA 8260B	7/2/02	91.3	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	7/2/02	91.5	70-130

KIFF ANALYTICAL, LLC

Approved By:  Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800



720 Olive Drive, Suite D
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Project Contact (Hardcopy or PDF to):
Ken Mateik

Lab No. 27219

Page 1 of 1

Company/Address:
Horizon Environmental

Phone No.: 939-2170

FAX No.: 939-2172

Project Number: 3493-53

Project Name: 3493 Fort Bragg

Project Address:
210 S. Main
Fort Bragg, CA

Sample Designation

MW-3

MW-4

MW-5

MW-6

MW-E

MW-W

EDF Report? ☒ Yes ☐ No

Recommended but not mandatory to complete this section:

Sampling Company Log Code: DEIO

Global ID: T0604500047

EDF Deliverable to (Email Address):
kmateik@horizonenvironmental.net

Sampler Signature:

Analysis Request

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ATTACHMENT D

HISTORICAL GROUNDWATER DATA

TABLE 1
GROUND WATER ELEVATION DATA
BEACON STATION #493
210 SOUTH MAIN STREET, FORT BRAGG, CALIFORNIA
(Measurements in feet)

Monitoring Well	Date	Reference Elevation (top of casing) ¹	Depth to Ground Water ¹	Ground Water Elevation ²	Well Depth	Comments
MW-1	03/26/92	66.95	3.29	63.66	---	Dry
	06/23/92		4.65	62.30	---	
	10/01/92		---	---	---	
	10/20/92		---	---	---	
	02/03/93		---	---	---	Dry
	04/08/93		---	---	---	
	07/20/93		4.99	61.96	5.67	Considered Dry
	10/27/93		5.54	61.41	5.69	
	02/01/94		4.34	62.61	5.74	
	04/19/94		3.93	63.02	5.76	
	08/03/94		5.09	61.86	5.76	Dry
	10/28/94		---	---	5.54	
	01/25/95		2.88	64.07	5.54	
	04/27/95		2.98	63.97	5.54	
	07/26/95		4.43	62.52	5.56	Dry
	11/15/95		---	---	5.57	
	02/15/96		3.21	63.74	5.57	
	05/09/96		3.49	63.46	5.57	
	08/21/96		4.95	62.00	5.60	Dry
	11/13/96		---	---	5.56	
	02/26/97		3.07	63.88	5.56	
	05/29/97		4.06	62.89	5.60	
	07/29/97					Abandoned
MW-1A	03/26/92	64.60	4.37	60.23	---	
	06/23/92		5.29	59.31	---	
	10/01/92		5.85	58.75	---	
	10/20/92		5.90	58.70	13.00	
	02/03/93		4.03	60.57	13.00	
	04/08/93		4.16	60.44	12.96	
	07/20/93		4.99	59.61	12.93	
	10/27/93		5.84	58.76	12.93	
	02/01/94		4.73	59.87	12.92	
	04/19/94		4.80	59.80	12.90	
	08/03/94		5.53	59.07	12.90	
	10/28/94		6.04	58.56	12.70	
	01/25/95		3.88	60.72	12.72	
	04/27/95		4.17	60.43	12.72	
	07/26/95		5.22	59.38	12.72	
	11/15/95		6.23	58.37	12.74	
	02/15/96		4.53	60.07	12.77	
	05/09/96		4.70	60.90	12.76	
	08/21/96		5.60	59.00	12.76	
	11/13/96		5.98	58.62	12.72	
	02/26/97		4.28	60.32	12.73	
	05/29/97		4.78	59.82	12.75	
	07/29/97		5.82	58.78	12.76	
	11/25/97		6.05	58.55	12.74	

NOTES: 1 = Measurement and reference elevation taken from notch/mark on top north side of well casing.
2 = Elevation referenced to mean sea level.
--- = Not measured.
Well Depth = Measurement from top of casing to bottom of well.

TABLE 1
GROUND WATER ELEVATION DATA
BEACON STATION #493
210 SOUTH MAIN STREET, FORT BRAGG, CALIFORNIA
(Measurements in feet)

Monitoring Well	Date	Reference Elevation (top of casing) ¹	Depth to Ground Water ¹	Ground Water Elevation ²	Well Depth	Comments
MW-2A	03/26/92	64.33	4.51	59.82	—	
	06/23/92		5.27	59.06	—	
	10/01/92		5.84	58.49	—	
	10/20/92		5.73	58.60	13.00	
	02/03/93		4.12	60.21	13.00	
	04/08/93		4.05	60.28	12.98	
	07/20/93		4.90	59.43	12.95	
	10/27/93		5.80	58.53	12.95	
	02/01/94		4.67	59.66	12.91	
	04/19/94		4.76	59.57	12.91	
	08/03/94		5.46	58.87	12.90	
	10/28/94		6.04	58.29	12.69	
	01/25/95		3.83	60.50	12.71	
	04/27/95		4.12	60.21	12.73	
	07/26/95		5.16	59.17	12.70	
	11/15/95		6.25	58.08	12.75	
	02/15/96		4.53	59.80	12.75	
	05/09/96		4.66	59.67	12.74	
	08/21/96		5.57	58.76	12.79	
	11/13/96		5.99	58.34	12.74	
	02/26/97		4.29	60.04	12.72	
	05/29/97		4.78	59.55	12.80	
	07/29/97		5.74	58.59	12.80	
	11/25/97		5.91	58.42	12.80	
MW-3	03/26/92	64.04	4.22	59.82	—	
	06/23/92		5.13	58.91	—	
	10/01/92		5.67	58.37	—	
	10/20/92		5.61	58.43	15.00	
	02/03/93		3.96	60.08	15.00	
	04/08/93		4.03	60.01	15.08	
	07/20/93		4.75	59.29	15.08	
	10/27/93		5.58	58.46	15.09	
	02/01/94		4.44	59.60	11.23	
	04/19/94		4.59	59.45	11.85	
	08/03/94		5.28	58.76	11.87	
	10/28/94		5.85	58.19	11.65	
	01/25/95		3.68	60.36	11.71	
	04/27/95		4.03	60.01	13.01	
	07/26/95		5.01	59.03	13.00	
	11/15/95		6.10	57.94	13.28	
	02/15/96		4.46	59.58	13.28	
	05/09/96		4.59	59.45	13.42	
	08/21/96		4.93	59.11	13.45	
	11/13/96		5.85	58.19	13.68	
	02/26/97		4.21	59.83	13.69	
	05/29/97		4.70	59.34	13.43	
	07/29/97		5.53	58.51	13.41	
	11/25/97		5.67	58.37	13.40	

NOTES: 1 = Measurement and reference elevation taken from notch/mark on top north side of well casing.
2 = Elevation referenced to mean sea level.
— = Not measured.
Well Depth = Measurement from top of casing to bottom of well.

TABLE 1
GROUND WATER ELEVATION DATA
BEACON STATION #493
210 SOUTH MAIN STREET, FORT BRAGG, CALIFORNIA
(Measurements in feet)

Monitoring Well	Date	Reference Elevation (top of casing) ¹	Depth to Ground Water ¹	Ground Water Elevation ²	Well Depth	Comments
MW-3A	03/26/92	65.23	3.56	61.67	---	
	06/23/92		4.66	60.57	---	
	10/01/92		5.46	59.77	---	
	10/20/92		5.50	59.73	13.00	
	02/03/93		3.37	61.86	13.00	
	04/08/93		3.45	61.78	13.07	
	07/20/93		4.19	61.04	13.06	
	10/27/93		5.35	59.88	13.04	
	02/01/94		4.09	61.14	12.58	
	04/19/94		4.10	61.13	12.63	
	08/03/94		4.95	60.28	12.65	
	10/28/94		5.67	59.56	12.42	
	01/25/95		3.19	62.04	12.45	
	04/27/95		3.35	61.88	12.45	
	07/26/95		4.49	60.74	12.44	
	11/15/95		6.27	58.96	14.21	
	02/15/96		3.69	61.54	14.21	
	05/09/96		3.84	61.39	13.28	
	08/21/96		5.42	59.81	13.27	
	11/13/96		5.47	59.76	13.28	
MW-4	02/26/97	65.82	3.46	61.77	13.28	
	05/29/97		4.07	61.16	---	
	07/29/97		5.49	59.74	13.25	
	11/25/97		6.17	59.06	13.25	
	03/26/92		4.19	61.63	---	
	06/23/92		5.27	60.55	---	
	10/01/92		5.98	59.84	---	
	10/20/92		6.00	59.82	15.00	
	02/03/93		3.96	61.86	15.00	
	04/08/93		3.91	61.91	15.06	
	07/20/93		5.42	60.40	15.01	
	10/27/93		5.35	60.47	15.00	
	02/01/94		4.57	61.25	12.13	
	04/19/94		4.65	61.17	12.75	
	08/03/94		5.47	60.35	12.77	
	10/28/94		6.15	59.67	12.52	
	01/25/95		3.68	62.14	12.55	
	04/27/95		3.68	62.14	13.41	
	07/26/95		5.03	60.79	13.42	
	11/15/95		6.63	59.19	14.46	
	02/15/96		4.23	61.59	14.45	
	05/09/96		4.50	61.32	14.22	
	08/21/96		5.53	60.29	14.22	
	11/13/96		6.07	59.75	14.18	
	02/26/97		4.14	61.68	14.19	
	05/29/97		4.67	61.15	14.22	
	07/29/97		5.81	60.01	14.22	
	11/25/97		5.88	59.94	14.22	

NOTES: 1 = Measurement and reference elevation taken from notch/mark on top north side of well casing.
2 = Elevation referenced to mean sea level.
--- = Not measured.
Well Depth = Measurement from top of casing to bottom of well.

TABLE 1
GROUND WATER ELEVATION DATA
BEACON STATION #493
210 SOUTH MAIN STREET, FORT BRAGG, CALIFORNIA
(Measurements in feet)

Monitoring Well	Date	Reference Elevation (top of casing) ¹	Depth to Ground Water ¹	Ground Water Elevation ²	Well Depth	Comments
MW-5	03/26/92	68.18	3.95	64.23	---	
	06/23/92		5.44	62.74	---	
	10/01/92		6.45	61.73	---	
	10/20/92		6.50	61.68	15.00	
	02/03/93		3.70	64.48	15.00	
	04/08/93		3.96	64.22	14.97	
	07/20/93		5.00	63.18	14.96	
	10/27/93		6.38	61.80	14.95	
	02/01/94		5.15	63.03	13.29	
	04/19/94		4.74	63.44	13.84	
	08/03/94		5.90	62.28	13.84	
	10/28/94		5.71	61.47	13.61	
	01/25/95		3.66	64.52	13.60	
	04/27/95		3.83	64.35	14.29	
	07/26/95		5.29	62.89	14.28	
	11/15/95		4.57	63.44	14.12	
	02/15/96		3.96	64.22	14.12	
	05/09/96		4.31	63.87	14.45	
	08/21/96		5.76	62.42	14.46	
	11/13/96		6.34	61.84	14.44	
MW-6	02/26/97	66.81	3.85	64.33	14.44	
	05/29/97		4.80	63.38	14.46	
	07/29/97		6.67	61.51	14.46	
	11/25/97		6.47	61.71	14.45	
	03/26/92		2.46	64.35	---	
	06/23/92		4.32	62.49	---	
	10/01/92		4.30	62.51	---	
	10/20/92		4.43	62.38	15.00	
	02/03/93		1.87	64.94	15.00	
	04/08/93		1.90	64.91	15.02	
	07/20/93		3.22	63.59	15.00	
	10/27/93		4.10	62.71	15.00	
	02/01/94		2.66	64.15	14.97	
	04/19/94		2.87	63.94	13.90	
	08/03/94		3.92	62.89	13.97	
	10/28/94		4.54	62.27	13.75	
	01/25/95		1.07	65.74	13.75	
	04/27/95		1.77	65.04	14.11	
	07/26/95		3.41	63.40	14.10	
	11/15/95		5.75	61.06	12.43	
	02/15/96		2.15	64.66	12.43	
	05/09/96		2.47	64.34	14.15	
	08/21/96		3.86	62.95	14.18	
	11/13/96		4.27	62.54	14.11	
	02/26/97		2.23	64.58	14.11	
	05/29/97		3.03	63.78	14.15	
	07/29/97		3.98	62.83	14.15	
	11/25/97		3.70	63.11	14.14	

NOTES: 1 = Measurement and reference elevation taken from notch/mark on top north side of well casing.
2 = Elevation referenced to mean sea level.
— = Not measured.
Well Depth = Measurement from top of casing to bottom of well.

TABLE 2
GROUND WATER ANALYTICAL RESULTS
BEACON STATION #493
210 SOUTH MAIN STREET, FORT BRAGG, CALIFORNIA
(All results in micrograms per Liter)

Monitoring Well	Date Collected	Total Petroleum Hydrocarbons	Aromatic Volatile Organics				
		Gasoline	MTBE ¹	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-1	03/26/92	65,000		760	2,800	720	7,800
	06/23/92	150,000		860	3,000	720	13,000
	10/01/92	NS		NS	NS	NS	NS
	10/20/92	NS		NS	NS	NS	NS
	02/03/93	NS		NS	NS	NS	NS
	04/08/93	NS		NS	NS	NS	NS
	07/20/93	11,000		27	180	260	2,400
	10/27/93	NS		NS	NS	NS	NS
	02/01/94	13,000		110	380	430	5,200
	04/19/94	21,000		130	480	560	8,200
	08/03/94	NS		NS	NS	NS	NS
	10/28/94	NS		NS	NS	NS	NS
	01/25/95	30,000		280	1,100	1,200	13,000
	04/27/95	26,000		<50	280	780	11,000
	07/26/95	21,000		28	140	620	7,800
	11/15/95	NS		NS	NS	NS	NS
	02/15/96	25,000		140	430	850	9,300
	05/09/96	19,000	<130	31	210	190	6,200
	08/21/96	NS	NS	NS	NS	NS	NS
	11/13/96	NS	NS	NS	NS	NS	NS
	02/26/97	18,000	<130	<13	54	230	4,600
	05/29/97	17,000	240	9.5	16	170	2,700
	07/29/97 ²						
MW-1A	03/26/92	<50		<0.5	<0.5	<0.5	<0.5
	06/23/92	<50		<0.5	<0.5	<0.5	<0.5
	10/01/92	<50		<0.5	<0.5	<0.5	<0.5
	10/20/92	<50		<0.5	<0.5	<0.5	<0.5
	02/03/93	<50		<0.5	<0.5	<0.5	<0.5
	04/08/93	<50		<0.5	<0.5	<0.5	1.3
	07/20/93	<50		<0.5	<0.5	<0.5	<0.5
	10/27/93	<50		<0.5	<0.5	<0.5	<0.5
	02/01/94	<50		<0.5	<0.5	<0.5	<0.5
	04/19/94	<50		<0.5	<0.5	<0.5	<0.5
	08/03/94	<50		<0.5	<0.5	<0.5	<0.5
	10/28/94	<50		<0.5	<0.5	<0.5	<0.5
	01/25/95	<50		<0.5	<0.5	<0.5	<0.5
	04/27/95	<50		<0.5	<0.5	<0.5	<0.5
	07/26/95	<50		<0.50	<0.50	<0.50	<0.50
	11/15/95	<50		<0.50	<0.50	<0.50	<0.50
	02/15/96	<50		<0.50	<0.50	<0.50	<0.50
	05/09/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	08/21/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	11/13/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	02/26/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	05/29/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	07/29/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	11/25/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50

NOTES:
 < = Below indicated detection limit.
 NS = Not sampled.
 1 = Well abandoned.

TABLE 2
GROUND WATER ANALYTICAL RESULTS
BEACON STATION #493
210 SOUTH MAIN STREET, FORT BRAGG, CALIFORNIA
(All results in micrograms per Liter)

Monitoring Well	Date Collected	Total Petroleum Hydrocarbons	Aromatic Volatile Organics				
		Gasoline	MTBE ¹	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-2A	03/26/92	9,400		220	16	200	340
	06/23/92	20,000		230	270	320	1,100
	10/01/92	12,000		350	140	280	840
	10/20/92	3,600		320	130	270	880
	02/03/93	210		10	0.53	1.5	1.4
	04/08/93	<50		1.5	<0.5	1.5	1.4
	07/20/93	1,200		74	8.5	51	70
	10/27/93	6,500		390	240	430	1,300
	02/01/94	740		48	3.1	18	15
	04/19/94	3,300		310	190	270	510
	08/03/94	1,900		130	54	170	420
	10/28/94	3,200		170	92	170	440
	01/25/95	610		35	0.69	4.3	4.7
	04/27/95	500		21	0.81	12	3.6
	07/26/95	1,500		95	52	130	290
	11/15/95	3,600		220	120	260	660
	02/15/96	650		44	2.8	27	32
	05/09/96	520	<5.0	66	26	61	100
	08/21/96	3,300	210	160	45	210	470
	11/13/96	4,100	92	250	62	300	570
	02/26/97	200	9.6	15	0.69	8.0	2.6
	05/29/97	1,400	77	94	34	110	170
	07/29/97	550	37	33	2.3	28	42
	11/25/97	<50	<5.0	2.6	<0.50	<0.50	<0.50
MW-3	03/26/92	<50		<0.5	<0.5	<0.5	<0.5
	06/23/92	<50		<0.5	<0.5	<0.5	<0.5
	10/01/92	<50		<0.5	<0.5	<0.5	<0.5
	10/20/92	<50		<0.5	<0.5	<0.5	<0.5
	02/03/93	<50		<0.5	<0.5	<0.5	<0.5
	04/08/93	<50		<0.5	<0.5	.98	2.9
	07/20/93	<50		<0.5	<0.5	<0.5	<0.5
	10/27/93	<50		<0.5	<0.5	<0.5	<0.5
	02/01/94	<50		<0.5	<0.5	<0.5	<0.5
	04/19/94	<50		<0.5	<0.5	<0.5	<0.5
	08/03/94	<50		<0.5	<0.5	<0.5	<0.5
	10/28/94	<50		<0.5	<0.5	<0.5	<0.5
	01/25/95	<50		<0.5	<0.5	<0.5	<0.5
	04/27/95	<50		<0.5	<0.5	<0.5	<0.5
	07/26/95	<50		<0.50	<0.50	<0.50	<0.50
	11/15/95	<50		<0.50	<0.50	<0.50	<0.50
	02/15/96	<50		<0.50	<0.50	<0.50	<0.50
	05/09/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	08/21/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	11/13/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	02/26/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	05/29/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	07/29/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	11/25/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50

NOTES:
 < = Below indicated detection limit.
 NS = Not sampled.
 2 = Well abandoned.

TABLE 2
GROUND WATER ANALYTICAL RESULTS
BEACON STATION #493
210 SOUTH MAIN STREET, FORT BRAGG, CALIFORNIA
(All results in micrograms per Liter)

Monitoring Well	Date Collected	Total Petroleum Hydrocarbons	Aromatic Volatile Organics				
		Gasoline	MTBE ¹	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-3A	03/26/92	35,000		940	820	780	3,200
	06/23/92	40,000		780	720	670	2,700
	10/01/92	23,000		1,200	980	510	1,900
	10/20/92	21,000		2,000	1,800	1,700	7,200
	02/03/93	39,000		2,400	1,800	2,100	6,700
	04/08/93	18,000		930	870	880	3,500
	07/20/93	39,000		1,800	1,900	2,000	6,400
	10/27/93	4,700		290	410	390	1,400
	02/01/94	11,000		690	810	980	3,800
	04/19/94	8,700		510	620	710	2,700
	08/03/94	5,000		330	370	450	1,600
	10/28/94	3,600		250	430	280	1,100
	01/25/95	9,400		390	410	860	3,200
	04/27/95	8,100		370	250	690	2,600
	07/26/95	4,900		180	190	420	1,400
	11/15/95	2,600		130	210	230	830
	02/15/96	6,700		260	270	670	1,900
	05/09/96	6,100	330	300	150	560	1,700
	08/21/96	7,200	<50	210	240	490	1,700
	11/13/96	5,000	<50	200	290	410	1,300
	02/26/97	5,200	150	120	110	420	1,400
	05/29/97	6,300	<250	220	180	480	1,600
	07/29/97	15,000	<250	290	160	720	2,200
	11/25/97	390	6.6	20	1.0	26	62
MW-4	03/26/92	<50		<0.5	<0.5	<0.5	<0.5
	06/23/92	<50		<0.5	<0.5	<0.5	<0.5
	10/01/92	<50		<0.5	<0.5	<0.5	<0.5
	10/20/92	<50		<0.5	<0.5	<0.5	<0.5
	02/03/93	<50		<0.5	<0.5	<0.5	<0.5
	04/08/93	<50		<0.5	<0.5	<0.5	.56
	07/20/93	<50		<0.5	<0.5	<0.5	<0.5
	10/27/93	<50		<0.5	<0.5	<0.5	<0.5
	02/01/94	<50		<0.5	<0.5	<0.5	<0.5
	04/19/94	<50		<0.5	<0.5	<0.5	<0.5
	08/03/94	<50		<0.5	<0.5	<0.5	<0.5
	10/28/94	<50		<0.5	<0.5	<0.5	<0.5
	01/25/95	<50		<0.5	<0.5	<0.5	<0.5
	04/27/95	<50		<0.5	<0.5	<0.5	<0.5
	07/26/95	<50		<0.50	<0.50	<0.50	<0.50
	11/15/95	<50		<0.50	<0.50	<0.50	<0.50
	02/15/96	<50		<0.50	<0.50	<0.50	<0.50
	05/09/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	08/21/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	11/13/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	02/26/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	05/29/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	07/29/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	11/25/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50

NOTES:

< = Below indicated detection limit.
NS = Not sampled.
? = Well abandoned.

TABLE 2
GROUND WATER ANALYTICAL RESULTS
BEACON STATION #493
210 SOUTH MAIN STREET, FORT BRAGG, CALIFORNIA
(All results in micrograms per Liter)

Monitoring Well	Date Collected	Total Petroleum Hydrocarbons	Aromatic Volatile Organics				
		Gasoline	MTBE ¹	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-5	03/26/92	<50		<0.5	<0.5	<0.5	<0.5
	06/23/92	<50		<0.5	<0.5	<0.5	<0.5
	10/01/92	<50		<0.5	<0.5	<0.5	<0.5
	10/20/92	<50		<0.5	<0.5	<0.5	<0.5
	02/03/93	<50		<0.5	<0.5	<0.5	<0.5
	04/08/93	<50		<0.5	<0.5	<0.5	<0.5
	07/20/93	<50		<0.5	<0.5	<0.5	<0.5
	10/27/93	<50		<0.5	<0.5	<0.5	<0.5
	02/01/94	<50		<0.5	<0.5	<0.5	<0.5
	04/19/94	<50		<0.5	<0.5	<0.5	<0.5
	08/03/94	<50		<0.5	<0.5	<0.5	<0.5
	10/28/94	<50		<0.5	<0.5	<0.5	<0.5
	01/25/95	<50		<0.5	<0.5	<0.5	<0.5
	04/27/95	<50		<0.5	<0.5	<0.5	<0.5
	07/26/95	<50		<0.50	<0.50	<0.50	<0.50
	11/15/95	<50		<0.50	<0.50	<0.50	<0.50
	02/15/96	<50		<0.50	<0.50	<0.50	<0.50
	05/09/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	08/21/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	11/13/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	02/26/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	05/29/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	07/29/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	11/25/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
MW-6	03/26/92	<50		<0.5	<0.5	<0.5	<0.5
	06/23/92	<50		<0.5	<0.5	<0.5	<0.5
	10/01/92	<50		<0.5	<0.5	<0.5	<0.5
	10/20/92	<50		<0.5	<0.5	<0.5	<0.5
	02/03/93	<50		<0.5	<0.5	<0.5	<0.5
	04/08/93	<50		<0.5	<0.5	<0.5	<0.5
	07/20/93	<50		<0.5	<0.5	<0.5	<0.5
	10/27/93	<50		<0.5	<0.5	<0.5	<0.5
	02/01/94	<50		<0.5	<0.5	<0.5	<0.5
	04/19/94	<50		<0.5	<0.5	<0.5	<0.5
	08/03/94	<50		<0.5	<0.5	<0.5	<0.5
	10/28/94	<50		<0.5	<0.5	<0.5	<0.5
	01/25/95	<50		<0.5	<0.5	<0.5	<0.5
	04/27/95	<50		<0.5	<0.5	<0.5	<0.5
	07/26/95	<50		<0.50	<0.50	<0.50	<0.50
	11/15/95	<50		<0.50	<0.50	<0.50	<0.50
	02/15/96	<50		<0.50	<0.50	<0.50	<0.50
	05/09/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	08/21/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	11/13/96	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	02/26/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	05/29/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	07/29/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	11/25/97	<50	<5.0	<0.50	<0.50	<0.50	<0.50
MW-E	07/29/97	6,100	150	44	47	100	720
	11/25/97	750	<5.0	3.0	5.3	50	150
MW-W	07/29/97	1,900	97	6.6	42	200	340
	11/25/97	2,200	39	72	120	120	650

NOTES: < = Below indicated detection limit.
NS = Not sampled.
¹ = Well abandoned.

TABLE 1

GROUND WATER LEVELS AND PHYSICAL OBSERVATIONS

Location	Date	Reference Elevation (feet) ^a	Depth to Ground Water (feet)	Ground Water Elevation (feet)	Observations/Comments
MW-1	06/27/90	66.95	3.87	63.08	No sheen or free product
	10/09/90		5.44	61.51	No sheen or free product
	11/13/90		—	—	Not Accessible ^b
	12/14/90		—	—	Dry
	01/24/91		—	—	Not Measured
	02/28/91		—	—	Not Measured
	03/28/91		—	—	Not Measured
	04/18/91		2.97	63.98	No sheen or free product
	05/31/91		4.15	62.80	No sheen or free product
	06/18/91		4.50	62.45	No sheen or free product
	08/15/91		5.56	61.39	No sheen or free product
	09/10/91		5.57	61.38	No sheen or free product
	10/25/91		—	—	Dry
	12/11/91		—	—	Dry
	03/26/92		3.29	63.66	No sheen or free product
	06/23/92		4.65	62.30	No sheen or free product
	10/01/92		—	—	Dry
MW-2 ^c	06/27/90	67.02	4.45	62.57	No sheen or free product
	10/09/90		5.57	61.45	No sheen or free product
MW-1A	03/19/90	64.60	4.55	60.05	No sheen or free product
	11/13/90		5.44	61.51	Not Accessible ^b
	12/14/90		—	—	No sheen or free product
	01/24/91		5.92	58.78	No sheen or free product
	02/28/91		5.82	58.68	No sheen or free product
	03/28/91		5.53	59.07	No sheen or free product
	04/18/91		4.47	60.13	No sheen or free product
	05/31/91		4.72	59.88	No sheen or free product
	06/18/91		4.76	59.84	No sheen or free product
	08/15/91		5.10	59.50	No sheen or free product
	09/10/91		5.79	58.81	No sheen or free product
	10/25/91		6.09	58.51	No sheen or free product
	12/11/91		5.82	58.78	No sheen or free product
	03/26/92		4.37	60.23	No sheen or free product
	06/23/92		5.29	59.31	No sheen or free product
	10/01/92		5.85	58.75	No sheen or free product

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TABLE 1-Continued

GROUND WATER LEVELS AND PHYSICAL OBSERVATIONS

<u>Location</u>	<u>Date</u>	<u>Reference Elevation (feet)^a</u>	<u>Depth to Ground Water (feet)</u>	<u>Ground Water Elevation (feet)</u>	<u>Observations/Comments</u>
MW-2A	03/19/90	64.33	4.85	59.48	No sheen or free product
	11/13/90		—	—	Not Accessible ^b
	12/14/90		5.94	58.39	No sheen or free product
	01/24/91		5.83	58.50	No sheen or free product
	02/28/91		5.52	58.81	No sheen or free product
	03/28/91		4.53	59.80	No sheen or free product
	04/18/91		4.71	59.62	No sheen or free product
	05/31/91		4.64	59.69	No sheen or free product
	06/18/91		5.17	59.16	No sheen or free product
	08/15/91		5.82	58.51	No sheen or free product
	09/10/91		5.84	58.49	No sheen or free product
	10/25/91		6.06	58.27	No sheen or free product
	12/11/91		5.85	58.48	No sheen or free product
	03/26/92		4.51	59.82	No sheen or free product
	06/23/92		5.27	59.06	No sheen or free product
	10/01/92		5.84	58.49	No sheen or free product
MW-3A	06/27/90	65.23	4.49	60.74	No sheen or free product
	10/09/90		5.29	59.94	No sheen or free product
	11/13/90		—	—	Not Accessible ^b
	12/14/90		5.45	59.78	No sheen or free product
	01/24/91		5.36	59.87	No sheen or free product
	02/28/91		5.07	60.16	No sheen or free product
	03/28/91		3.96	61.27	No sheen or free product
	04/18/91		3.97	61.26	No sheen or free product
	05/31/91		4.11	61.12	No sheen or free product
	06/18/91		6.10	59.13	No sheen or free product
	08/15/91		5.17	60.06	No sheen or free product
	09/10/91		5.17	60.06	No sheen or free product
	10/25/91		5.49	59.74	No sheen or free product
	12/11/91		5.21	60.02	No sheen or free product
	03/26/92		3.56	61.67	No sheen or free product
	06/23/92		4.66	60.57	No sheen or free product
	10/01/92		5.46	59.77	No sheen or free product
MW-3	07/12/91	64.04	5.16	58.88	No sheen or free product
	08/15/91		5.57	58.47	No sheen or free product
	09/10/91		5.57	58.47	No sheen or free product
	10/25/91		5.91	58.13	No sheen or free product
	12/11/91		5.60	58.44	No sheen or free product
	03/26/92		4.22	59.82	No sheen or free product
	06/23/92		5.13	58.91	No sheen or free product
	10/01/92		5.67	58.37	No sheen or free product

TABLE 1-Continued

GROUND WATER LEVELS AND PHYSICAL OBSERVATIONS

<u>Location</u>	<u>Date</u>	<u>Reference Elevation (feet)^a</u>	<u>Depth to Ground Water (feet)</u>	<u>Ground Water Elevation (feet)</u>	<u>Observations/Comment</u>
MW-4	07/12/91	65.82	5.42	60.40	No sheen or free product
	08/15/91		5.96	59.86	No sheen or free product
	09/10/91		5.97	59.85	No sheen or free product
	10/25/91		6.27	59.55	No sheen or free product
	12/11/91		6.01	59.81	No sheen or free product
	03/26/92		4.19	61.63	No sheen or free product
	06/23/92		5.27	60.55	No sheen or free product
	10/01/92		5.98	59.84	No sheen or free product
MW-5	07/12/91	68.18	5.56	62.62	No sheen or free product
	08/15/91		6.27	61.91	No sheen or free product
	09/10/91		6.27	61.97	No sheen or free product
	10/25/91		6.63	61.55	No sheen or free product
	12/11/91		6.42	61.76	No sheen or free product
	03/26/92		3.95	64.23	No sheen or free product
	06/23/92		5.44	62.74	No sheen or free product
	10/01/92		6.45	61.73	No sheen or free product
MW-6	07/12/91	66.81	3.86	62.95	No sheen or free product
	08/15/91		4.05	62.76	No sheen or free product
	09/10/91		4.07	62.74	No sheen or free product
	10/25/91		4.37	62.44	No sheen or free product
	12/11/91		4.12	62.69	No sheen or free product
	03/26/92		2.46	64.35	No sheen or free product
	06/23/92		4.32	62.49	No sheen or free product
	10/01/92		4.30	62.51	No sheen or free product

^a Monitoring wells surveyed relative to riser of MW-3A; elevation is 65.23 feet above mean sea level as reported in I Corporation report dated June 1990.

^b Well access obstructed by construction activities related to vapor recovery system installation.

^c Well destroyed during installation of vapor recovery piping on November 12, 1990.

TABLE 2

GROUND WATER ANALYTICAL RESULTS

Concentrations in Parts Per Billion (ppb)

<u>Location</u>	<u>Date</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl- benzene</u>	<u>Xylenes</u>	<u>TPH as gasoline</u>	<u>TPH as diesel</u>
MW-1	06/27/90	2,200	7,900	1,700	15,000	96,000	NA ^a
	10/09/90	850	3,500	1,400	10,500	60,000	NA
	12/14/90 ^b	—	—	—	—	—	—
	03/28/91 ^c	—	—	—	—	—	—
	06/18/91	1,100	2,500	290	5,500	36,000	<100
	09/10/91	990	2,600	590	9,800	53,000	NA
	12/11/91 ^b	—	—	—	—	—	Dry
	03/26/92	760	2,800	720	7,800	65,000	NA
	06/23/92	860	3,000	720	13,000	150,000	NA
	10/01/92 ^b						
MW-2 ^d	06/27/90	1,100	450	2,600	490	8,400	NA
	10/09/90	150	16	14	44.8	1,700	NA
MW-1A	03/20/90 ^e	ND ^f	ND	ND	ND	ND	ND
	12/14/90	2.4	5.5	0.6	10	70	<100
	03/28/91	<0.5	0.8	<0.5	0.6	<50	<100
	06/18/91	<0.5	<0.5	<0.5	<0.5	<50	<100
	09/10/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	12/11/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	03/26/92	<0.5	<0.5	<0.5	<0.5	<50	NA
	06/23/92	<0.5	<0.5	<0.5	<0.5	<50	NA
	10/01/92	<0.5	<0.5	<0.5	<0.5	<50	NA
MW-2A	03/20/90 ^e	1,800	160	170	580	2,900	4,500
	12/14/90	660	580	760	2,800	17,000	<100
	03/28/91	78	6.1	24	36	1,200	<100
	06/18/91	49	7.6	18	39	1,400	<100
	09/10/91	250	47	6.8	2,000	11,000	NA
	12/11/91	510	410	470	1,800	24,000	NA
	03/26/92	220	16	200	340	9,400	NA
	06/23/92	230	270	320	1,100	20,000	NA
	10/01/92	350	140	280	840	12,000	NA
MW-3A	03/20/90 ^e	1,600	1,500	1,900	7,000	31,000	54,000
	06/27/90	1,400	1,800	1,300	5,600	38,000	NA
	10/09/90	840	1,100	640	2,820	18,000	NA
	12/14/90	920	1,200	660	2,400	17,000	<100
	03/28/91	340	450	240	940	6,800	<100
	06/18/91	970	1,300	700	3,000	23,000	<100
	09/10/91	1,300	1,800	1,000	4,200	28,000	NA
	12/11/91	500	380	390	1,700	23,000	NA
	03/26/92	940	820	780	3,200	35,000	NA
	06/23/92	780	720	670	2,700	40,000	NA
	10/01/92	1,200	980	510	1,900	23,000	NA

TABLE 2-Continued

GROUND WATER ANALYTICAL RESULTS

Concentrations in Parts Per Billion (ppb)

<u>Location</u>	<u>Date</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl- benzene</u>	<u>Xylenes</u>	<u>TPH as gasoline</u>	<u>TPH as diesel</u>
MW-3	07/12/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	09/10/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	12/11/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	03/26/92	<0.5	<0.5	<0.5	<0.5	<50	NA
	06/23/92	<0.5	<0.5	<0.5	<0.5	<50	NA
	10/01/92	<0.5	<0.5	<0.5	<0.5	<50	NA
MW-4	07/12/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	09/10/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	12/11/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	03/26/92	<0.5	<0.5	<0.5	<0.5	<50	NA
	06/23/92	<0.5	<0.5	<0.5	<0.5	<50	NA
	10/01/92	<0.5	<0.5	<0.5	<0.5	<50	NA
MW-5	07/12/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	09/10/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	12/11/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	03/26/92	<0.5	<0.5	<0.5	<0.5	<50	NA
	06/23/92	<0.5	<0.5	<0.5	<0.5	<50	NA
	10/01/92	<0.5	<0.5	<0.5	<0.5	<50	NA
MW-6	07/12/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	09/10/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	12/11/91	<0.5	<0.5	<0.5	<0.5	<50	NA
	03/26/92	<0.5	<0.5	<0.5	<0.5	<50	NA
	06/23/92	<0.5	<0.5	<0.5	<0.5	<50	NA
	10/01/92	<0.5	<0.5	<0.5	<0.5	<50	NA

a NA = Not analyzed.

b Well was dry on this date; no sample collected.

c Not sampled.

d Well destroyed during installation of vapor recovery piping on November 12, 1990.

e Sampled by IT Corporation.

f ND = Not Detected; detection limit not known.

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APPENDIX D

FILE REVIEW DOCUMENTS

***TRC'S REPORT OF FINDINGS PRELIMINARY INVESTIGATION DEMOLITION
SUPPORT SERVICES***



Customer-Focused Solutions

April 1, 1998

Project No. 97-734

Mr. Larry L. Lake
Environmental Site Coordinator
Georgia-Pacific Corporation
90 West Redwood Avenue
Fort Bragg, California 95437

Report of Findings
Preliminary Investigation
Demolition Support Services
Georgia-Pacific Fort Bragg Facility
Fort Bragg, California

Dear Mr. Lake:

Pursuant to our proposal to provide Demolition Support Services, dated November 24, 1997 (Proposal), TRC is providing this Report of Findings for the recently completed Preliminary Investigation at the Georgia-Pacific Sawmill located at 90 Redwood Avenue in Fort Bragg, California (Site). The Preliminary Investigation activities were conducted on behalf of Georgia-Pacific Corporation (G-P) during January 20-22, 1998 to evaluate coatings (paint) on selected buildings, and to determine if contaminants associated with prior Site operations are present in subsurface soils in areas scheduled for demolition.

It is our understanding that the demolition contractor has already been selected by G-P. The objectives of the Preliminary Investigation were limited to the following:

- Determination of lead content in painted coatings of buildings slated for demolition.
- Determination of the nature of chemical impacts, if any, to subsurface soils beneath buildings slated for demolition.

Preliminary Investigation activities focused on areas scheduled for demolition and included a lead-based paint survey and the collection of 48 soil samples from the Site. Selected painted Site structures to be demolished were tested for the presence of lead using a portable X-ray Fluorescence Analyzer (XRF). Soil samples were collected from selected locations in the demolition areas (e.g., beneath building floors) based on consideration of prior Site operations. Soil samples were analyzed at a state-certified laboratory for some or all of the chemical constituents listed below. In accordance with G-P requirements, laboratory analytical services were contracted directly by G-P with Alpha Analytical Laboratories, Inc. in Ukiah, California.

- Total Petroleum Hydrocarbons as Diesel (TPH/D) by EPA Method 8015M
- TPH as Motor Oil (TPH/MO) by EPA Method 8015M

- Polychlorinated Biphenyls (PCBs) by EPA Method 8080
- Volatile Organic Compounds (VOCs) by EPA Method 8260B.

A summary of field activities and associated findings is provided below for the lead-based paint survey and the soil sampling investigation.

1.0 LEAD-BASED PAINT SURVEY

1. In accordance with the procedures outlined in the Proposal, a certified lead inspector/risk assessor from The Szaras Companies (TSC) conducted an inspection of the following five selected Site facilities to identify the presence of lead-based paint:
 - Sawmill Building
 - Lath Plant Building
 - Old Debarker
 - Planing Mill No. 1
 - Planing Mill No. 50.
2. The testing procedure involved the automated averaging of three scans of each painted structure using the XRF. Details of the testing method are outlined in the TSC Report, a copy of which is included in Attachment A to this Report of Findings.
3. Although no federal, state or local regulatory standards have been promulgated which stipulate a threshold concentration of lead in intact paint, a commonly used reference value recommended by the U.S. Department of Housing and Urban Development (HUD) has been adopted for guidance. The HUD threshold of 1.0 mg/cm² is applicable to federally owned or subsidized housing and is typically used to determine if remedial actions are appropriate at private residential and/or industrial facilities.
4. The primary findings of the TSC report indicate that painted areas with lead levels exceeding the HUD guideline account for a small percentage (less than 10%) of the overall painted areas in the buildings. According to the TSC Report, "A majority of paint found to contain lead above the HUD guideline limits is in poor or unsatisfactory condition..." A summary of results for the selected painted surfaces tested at each of the five facilities is provided below:
 - Sawmill: Yellow (13 out of 44), red (4 out of 14), white (3 out of 72) and gray (3 out of 6) painted surfaces were found to have elevated levels

of lead (i.e., exceeding 1 mg/cm²). Peak levels up to 19.029 mg/cm² were reported. Surfaces painted with green (43), blue (15) and tan (12) paint had lead levels below the HUD threshold.

- Lath Plant: None of the 40 painted surfaces tested was found to have elevated levels of lead.
 - Old Debarker: Some of the yellow painted surfaces (4 out of 7) were found to have elevated levels of lead. Peak levels up to 9.280 mg/cm² were reported. Surfaces painted with green (3), red (3), white (9), blue (7) and tan (6) paint had lead levels below the HUD threshold.
 - Planing Mill No. 1: Yellow (14 out of 21), red (5 out of 11), and orange (3 out of 5) painted surfaces were found to have elevated levels of lead. Peak levels up to 10.766 mg/cm² were reported. Surfaces painted with white (17), green (6), blue (6) and tan (12) paint had lead levels below the HUD threshold.
 - Planing Mill No. 50: Yellow (2 out of 8), red (4 out of 8) and orange (4 out of 4) painted surfaces were found to have elevated levels of lead. Peak levels up to 6.369 mg/cm² were reported. Surfaces painted with white (17), green (11), blue (7), gray (3) and tan (27) paint had lead levels below the HUD threshold.
5. As recommended in the TSC Report, painted surfaces in poor or unsatisfactory condition should be removed from the identified structures and analyzed to determine appropriate waste classification and disposal options. Since the majority of painted surfaces were found to have lead levels below the HUD guideline, paint chips and debris generated during building demolition are not likely to contain hazardous levels of lead.

2.0 SOIL SAMPLING INVESTIGATION

1. Soil samples were collected from borings advanced in 24 selected locations at the Site based on a review of prior Site operations and access considerations. A limited access rig was used given the restricted access within existing buildings. Boring locations were selected by G-P and TRC personnel based on knowledge of prior operations in each facility and access considerations for the drill rig. The approximate location of each boring (i.e., soil sample) was determined in the field using standard tape survey methods (Figure 1). As appropriate, reference points used to determine distances to each boring included building corners and

other building features which were likely to be easily located following demolition of walls and roof structures.

2. Two samples were collected from each boring: A surface sample (A) at a nominal depth of 0.5 feet below ground surface (bgs)⁽¹⁾, and a subsurface sample (B) collected from a depth of approximately 2.5 to 3.0 feet bgs. Samples were collected by driving a split-spoon sampler (lined with two 2-inch by 6-inch brass sleeves) to the desired depth using a 140-pound hammer. Within building structures (i.e., Planing Mills No. 1, 50; and the Sawmill Building), the sampler was driven to the desired sampling depth following the preliminary drilling through a 3- to 6-inch thick concrete or asphalt cover.
3. Following removal of the soil from the brass sampling tube and visual observation of the sample, the soil was placed in a glass jar, labeled according to location, and stored in an ice chest cooled to approximately 4 °C. Samples were transmitted to a state-certified laboratory for analysis under appropriate Chain-of-Custody protocol.
4. Soil samples collected during the Preliminary Investigation were analyzed for the above listed constituents by Alpha Analytical Laboratories, Inc., a state-certified laboratory, according to applicable EPA methods. A copy of the laboratory report for these analyses is included in Attachment B to this Report of Findings. Tabulated summaries of reported analytical results for the 48 soil samples (i.e., 24 near surface and 24 subsurface samples) collected during the Preliminary Investigation are provided in Figure 1.
5. In an effort to determine the leaching potential of reported TPH in Site soil, soluble fractions were extracted from two soil samples with reportedly elevated levels of TPH/D and TPH/MO (SM-12B/2.5 & P1-2A/0.5). The extracts were obtained by the Threshold Contaminant Leaching Procedure (TCLP) using deionized (DI) water as an extraction solvent. The extracts were analyzed for TPH/D and TPH/MO by EPA Method 8015M.

⁽¹⁾ Ground surface is defined at each location as the top of exposed soil; since most borings required initially drilling through approximately 3 to 6 inches of concrete or asphalt, surface samples were typically collected from the exposed soil within 6 inches below the bottom of the concrete/asphalt.

3.0 EVALUATION OF RESULTS

1. No detectable levels of PCBs were reported in soil samples analyzed by EPA Method 8080. As indicated in Figure 1, detectable levels of TPH as diesel and/or as motor oil (TPH/D, TPH/MO) were reported in all but five of the soil samples collected from the Site. The following soil samples were reported to contain levels of TPH/D or TPH/MO in excess of 500 mg/kg or 1,000 mg/kg, respectively, as indicated in Figure 1:

SAMPLE ID	DEPTH (ft)	TPH/D (mg/kg)	TPH/MO (mg/kg)	COMMENTS
SM-1B/2.5	2.5	160	1,000	East area of Sawmill Bldg
SM-2B/2.5	2.5	3,400	7,200	East area of Sawmill Bldg
SM-3A/0.5	0.5	850	5,500	East area of Sawmill Bldg
SM-4A/0.5	0.5	300	1,400	East area of Sawmill Bldg
SM-10B/2.5	2.5	780	3,000	Southwest end of Sawmill Bldg
SM-12A/0.5	0.5	160	1,100	Southwest end of Sawmill Bldg
SM-12B/2.5	2.5	4,200	16,000	Southwest end of Sawmill Bldg; Soluble fraction had 2.3 mg/L and 9.1 mg/L of TPH/D and TPH/MO, respectively
GC-1A/0.5	0.5	330	1,600	North end of Existing Green Chain Structure
P1-1A/0.5	0.5	610	1,600	Southwest corner of Planer No. 1
P1-2A/0.5	0.5	500	2,900	South area of Planer No. 1; Soluble fraction had < 0.05 mg/L and 0.23 mg/L of TPH/D and TPH/MO, respectively
P1-2B/2.5	2.5	220	1,200	South area of Planer No. 1
P1-3A/0.5	0.5	160	2,400	South-central area of Planer No. 1

2. Results of leachability tests indicate that elevated levels of petroleum hydrocarbons could leach from soil into surface water (e.g., rainfall), but the magnitude of leaching is likely to be minimal (i.e., less than 0.06% based on comparison between reported concentrations in leachate versus levels in soil matrix). The potential level of leached petroleum hydrocarbons could, however, be sufficient to produce a noticeable sheen on the affected water's surface.
3. Access considerations limited the number and location of soil samples collected from the eastern portion of the Sawmill Building. This area had been identified as an area of specific interest based on a review of historic Site operations in the Sawmill Building. The area had been used for industrial operations prior to construction of the sawmill building and

placement of the concrete flooring; local soils may have therefore been impacted by prior operations. Elevated concentrations of petroleum hydrocarbons reported for soil samples collected from Borings SM-1 through SM-4 in this area are consistent with the initial identification of this area of interest.

4. Boring SM-12 was the only boring collected from areas adjacent to and outside the Sawmill Building. Since this area is not beneath a protective floor cover, additional sampling may be warranted to determine the extent of observed impacts to the soil, and to accurately assess the potential for stormwater impacts in this uncovered area.
5. Due to access limitations, it was not possible to sample soils in the immediate vicinity of the former dip tank in Planing Mill No. 1 (e.g., for VOCs). If access considerations can be resolved (e.g., by removal of one or more walls in this portion of the building), it may be useful to collect soil samples from this area of interest.
6. The indicated results for samples collected from Borings P1-2 through P1-4 in the southern portion of Planing Mill No. 1 may be consistent with the use of hydraulic oils in this area; a number of equipment footings were reportedly situated in this area along the eastern edge of the building. Further sampling of the Planing Mill No. 1 may be necessary before disturbing the floor.
7. Access considerations precluded the collection of soil samples from beneath the existing Green Chain structure. Following demolition of this structure, it may be useful to collect soil samples from this area to more definitively determine if the underlying soil has been impacted by previous operation of the Green Chain.

4.0 RECOMMENDATIONS

1. The following recommendations are offered for further evaluation of areas and facilities to be demolished at the Site:
 - Painted surfaces with lead above the HUD guideline that are in poor or unsatisfactory condition should be removed from the identified structures and analyzed to determine appropriate waste classification and disposal options. Appropriate health and safety measures should be

Mr. Larry L. Lake
April 1, 1998
Page 7

established and implemented during the removal of lead-impacted painted surfaces. A lead abatement contractor can be retained for this aspect of the demolition.

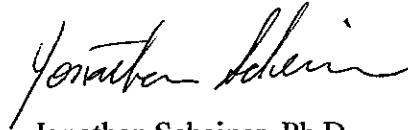
- Existing flooring in each of the identified structures should be maintained intact and sealed to minimize the potential for leaching of hydrocarbons by surface infiltration following demolition of roofing and walls.
 - In the event G-P decides to remove or disturb the sealed flooring areas, additional sampling of selected areas should be conducted to further delineate the extent of soil contamination and evaluate remediation alternatives. Specific areas of interest include:
 - Former dip tank in Planing Mill No. 1
 - Eastern portion of Sawmill
 - Western exterior of Sawmill (i.e., near Boring SM-12)
 - Soils beneath Green Chain structure
 - Areas in the vicinity of former equipment footings in Planing Mill No. 1.
2. Exposed surface areas with visible soil staining should be removed and remediated onsite. TRC can assist in the excavation and remediation of impacted soils.

If you have any questions regarding these findings, please call.

Sincerely,



Mohammad Bazargani
Project Manager



Jonathan Scheiner, Ph.D.
Senior Project Scientist

MRB/JES/jes
Attachments

cc: Roger Sherwood, Georgia-Pacific Corporation
Miro Knezevic, TRC
Deems Padgett, TRC



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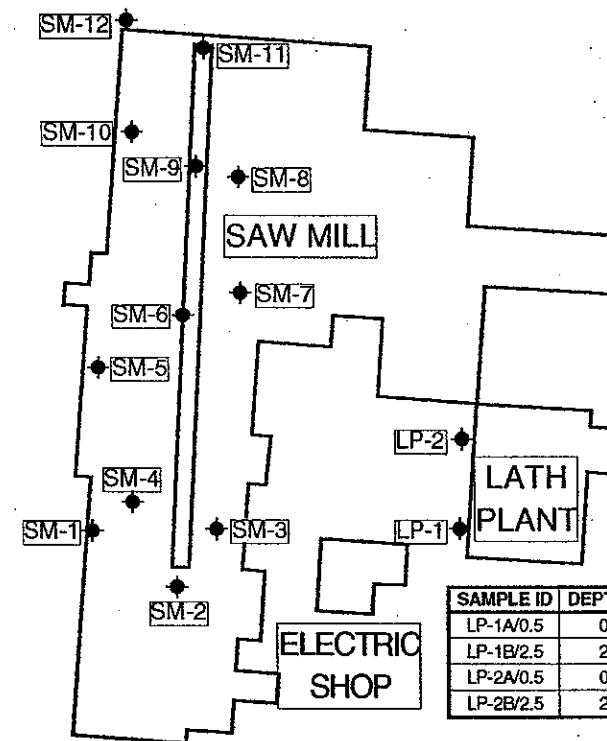
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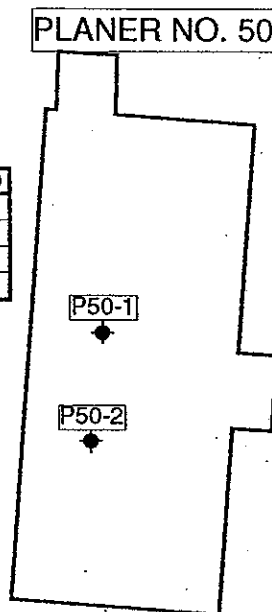
SAMPLE ID	DEPTH (ft)	PCBs	TPH/D	TPH/MO
SM-1A/0.5	0.5	NT	140.0	680.0
SM-1B/2.5	2.5	NT	160.0	1,100.0
SM-2A/0.5	0.5	NT	190.0	640.0
SM-2B/2.5	2.5	<0.2	3,400.0	7,200.0
SM-3A/0.5	0.5	<2	850.0	5,500.0
SM-3B/2.5	2.5	<2	31.0	200.0
SM-4A/0.5	0.5	NT	300.0	1,400.0
SM-4B/2.5	2.5	<0.2	3.0	11.0
SM-5A/0.5	0.5	NT	7.0	30.0
SM-5B/2.5	2.5	NT	5.5	19.0
SM-6A/0.5	0.5	<0.2	2.1	8.2
SM-6B/2.5	2.5	<0.2	3.2	14.0
SM-7A/0.5	0.5	NT	47.0	150.0
SM-7B/2.5	2.5	<0.2	<1	<2
SM-8A/0.5	0.5	NT	3.2	17.0
SM-8B/2.5	2.5	<0.2	6.5	21.0
SM-9A/0.5	0.5	NT	89.0	310.0
SM-9B/2.5	2.5	<0.2	240.0	540.0
SM-10A/0.5	0.5	NT	25.0	260.0
SM-10B/2.5	2.5	NT	780.0	3,000.0
SM-11A/0.5	0.5	NT	21.0	70.0
SM-11B/2.5	2.5	<0.2	1.0	3.1
SM-12A/0.5	0.5	NT	160.0	1,100.0
SM-12B/2.5	2.5	NT	4,200.0	16,000.0



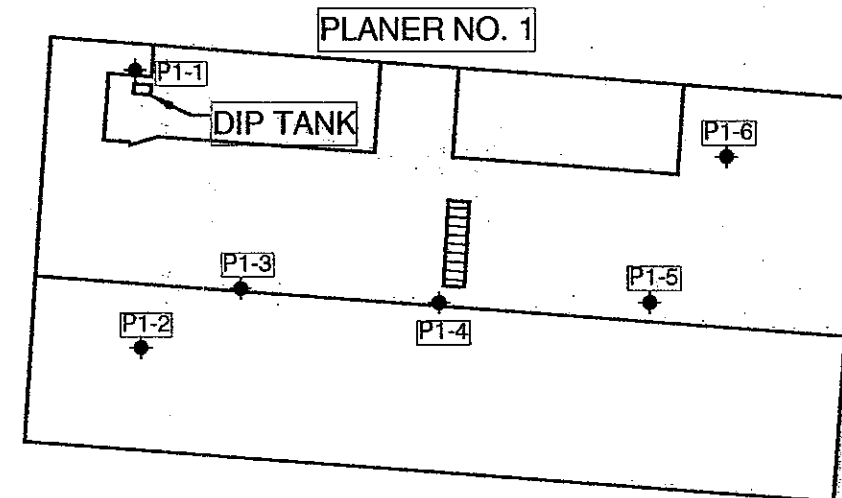
SAMPLE ID	DEPTH (ft)	PCBs	TPH/D	TPH/MO
LP-1A/0.5	0.5	NT	19.0	100.0
LP-1B/2.5	2.5	<0.2	<1	<2
LP-2A/0.5	0.5	NT	80.0	650.0
LP-2B/2.5	2.5	NT	<1	<2

SAMPLE ID	DEPTH (ft)	PCBs	TPH/D	TPH/MO
P50-1A/0.5	0.5	NT	25.0	120.0
P50-1B/2.5	2.5	NT	7.2	27.0
P50-2A/0.5	0.5	NT	81.0	430.0
P50-2B/2.5	2.5	<0.2	71.0	340.0

SAMPLE ID	DEPTH (ft)	PCBs	TPH/D	TPH/MO
GC-1A/0.5	0.5	NT	330.0	1,600.0
GC-1B/2.5	2.5	NT	1.2	9.4
GC-2A/0.5	0.5	NT	54.0	240.0
GC-2B/2.5	2.5	<0.2	6.0	34.0



SAMPLE ID	DEPTH (ft)	PCBs	TPH/D	TPH/MO
P1-1A/0.5	0.5	NT	610.0	1,600.0
P1-1B/2.5	2.5	<0.2	3.9	12.0
P1-2A/0.5	0.5	NT	500.0	2,900.0
P1-2B/2.5	2.5	<0.2	220.0	1,200.0
P1-3A/0.5	0.5	NT	160.0	2,400.0
P1-3B/2.5	2.5	NT	6.2	53.0
P1-4A/0.5	0.5	NT	<50	610.0
P1-4B/2.5	2.5	NT	1.2	<2
P1-5A/0.5	0.5	NT	2.0	8.7
P1-5B/2.5	2.5	NT	<1	<2
P1-6A/0.5	0.5	NT	3.9	56.0
P1-6B/2.5	2.5	<0.2	<1	2.5



LEGEND

◆ SM-3 Soil Boring

NOTES:

1. Analytical results indicated in mg/kg.
2. NT: Not Tested
3. PCB: Polychlorinated Biphenyls (EPA Method 8080)
4. TPH/D: Total Petroleum Hydrocarbons - Diesel (EPA Method 8015M)
5. TPH/MO: Total Petroleum Hydrocarbons - Motor Oil (EPA Method 8015M)

APPROXIMATE LOCATIONS OF
SOIL SAMPLING
AND ANALYTICAL RESULTSGEORGIA-PACIFIC CORPORATION
FORT BRAGG FACILITY

TRC

FIGURE 1

Handwritten text in a cursive script, likely a letter or a journal entry. The text is written in dark ink on a light-colored paper. The handwriting is somewhat slanted and appears to be from the 18th or 19th century. The text is organized into several paragraphs, with some lines indented. The overall tone of the writing is formal but personal.

Handwritten text in a cursive script, continuing from the left page. The text is written in dark ink on a light-colored paper. The handwriting is consistent with the left page, showing a slanted, cursive style. The text is organized into several paragraphs, with some lines indented. The overall tone of the writing is formal but personal.

APPENDIX D

FILE REVIEW DOCUMENTS

***STATUS REPORT MONITORING WELL AND BORING INSTALLATION WALSH
OIL ONE STOP SHOP***

STATUS REPORT MONITORING WELL and BORING INSTALLATION

WALSH OIL ONE STOP SHOP
105 S. Main Street
Fort Bragg, California

UGT No. 1TMC388

Prepared for:
Clarence Walsh
635 N. Franklin Street
Fort Bragg, CA 95437



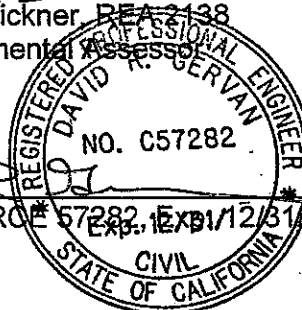
Christopher J. Watt, Staff Geologist



Frank R. Bickner, DE # 2138
Environmental Assessor



David R. Gervan, ROE # 57282, Exp. 12/31/01



LACO ASSOCIATES
CONSULTING ENGINEERS
21 W. 4th St. • PO 1023 • Eureka, CA 95502 • 707.443.5054

Dan Warner
CRWQCB
576-2671
(One Stop- 4598)

[illegible]

SUBSURFACE INVESTIGATION STATUS REPORT:

Monitoring Well and Boring Installation

One Stop Shell

105 South Main Street, Fort Bragg

LACO Project No. 4598.01; CRWQCB Case No. 1TMC388

EXECUTIVE SUMMARY

The subject property is owned by Georgia Pacific Company and is leased to Walsh Oil Company, who owns and operates the One Stop gas station. Upon receipt of laboratory results from soil and water samples collected during a permitted UST closure, CRWQCB notified the owner of the property that a workplan to assess the extent of soil and groundwater contamination was required. LACO ASSOCIATES was retained by Mr. Clarence Walsh as an engineering consultant to prepare the required workplan and has facilitated field work at the site to that effect. At this time, three significant secondary sources of TPHg contamination (soil) remain on site, the extent of secondary sources of TPHg contamination has not been delineated, groundwater on site has been impacted by hydrocarbons (TPHg, MTBE, BTEX). Groundwater gradient direction and slope on site may vary across the site from steeply to the west on the west side of the site, to southwesterly and gentle on the eastern side, and detectable concentrations of TPHg, BTEX, and MTBE in groundwater may extend off site. Complete details of methods, findings, and laboratory results from the work, along with conclusions and recommendations are presented in the following report.

INTRODUCTION

On April 6 and 7, 2000, LACO ASSOCIATES personnel observed Clear Heart Drilling install eight 4-inch diameter temporary borings and three 2-inch diameter monitoring wells at the One Stop Shell (Figure 1) located at 105 South Main Street in Fort Bragg. The work was performed according to the June 1999, *Workplan, Initial Subsurface Investigation*, prepared by LACO ASSOCIATES. This report contains the details of the well and boring installation, sampling and drilling methodologies, soil and groundwater laboratory results, interpretation of findings, and recommendations for future work at the site.

BACKGROUND

The subject property is located on an uplifted marine terrace on the west side of Main Street approximately 1800 feet east of the Pacific Ocean. According to the current owner, Clarence Walsh, the site has been used as a gas station since approximately 1960. Three underground storage tanks (USTs) were removed from the site in May 1998. Three

replacement USTs were installed following removal and excavation of approximately 380 cubic yards of contaminated soil.

BORING INSTALLATION

Eight temporary soil borings (B1-00 through B8-00) were installed on the site on April 6 and 7, 2000, by Clear Heart Drilling, see Figure 2 for locations. Borings were installed using a rotary drill rig fitted with 4-inch solid flight augers to a depth of approximately 15 feet below ground surface (bgs). Boring logs are included in Attachment 1. Soil samples were collected for laboratory analysis at 5-foot intervals and zones of obvious contamination. Borings were held open with slotted and capped 2-inch PVC pipe to allow for collection of groundwater samples. Groundwater was encountered between 7 and 8 feet bgs in each boring. The top of casing elevation of each boring was surveyed to a temporary benchmark, depth to water measurements were made, and a groundwater gradient map was generated to assist in locating the monitoring wells. Following final depth to water measurements, the borings were purged and allowed to recharge. Subsequently, groundwater samples were collected for laboratory analysis using ¾-inch disposable bailers. Following collection of groundwater samples and removal of the pipe, borings were promptly closed with hydrated bentonite chips, concrete grout (2 feet of grout), and cold patch asphalt to finished grade. Samples were kept cold and transported under chain of custody to North Coast Laboratories (NCL).

Soil samples were analyzed for:

- Total Petroleum Hydrocarbons as Gasoline by EPA Method 5035GCFID
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) by EPA Method 8021B
- Methyl-Tertiary-Butyl-Ether (MTBE) by EPA Method 8021B

Groundwater samples were analyzed for:

- Total Petroleum Hydrocarbons as Gasoline (TPHg) by EPA Method 8015B
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) by EPA Method 8260B
- MTBE, TAME, ETBE, DIPE, and TBA by EPA Method 8260B
- Lead Scavengers by EPA Method 8260B

MONITORING WELL INSTALLATION AND DEVELOPMENT

Three 2-inch diameter monitoring wells (MW-1 through MW-3) were installed at the site by Clear Heart Drilling, see Figure 2 for locations. MW-1 was completed to a depth of

approximately 15 feet bgs (drill rejection on bedrock), and MW-2 and MW-3 were completed to a depth of approximately 20 feet bgs. The wells were installed using a power rotary drilling rig fitted with 8-inch (OD) rotary hollow stem augers. Well logs are included in Attachment 1. Soil samples were collected for laboratory analysis at 5-foot intervals and at zones of obvious contamination.

Soil samples were kept cold and submitted to NCL for analysis of:

- Total Petroleum Hydrocarbons as Gasoline (TPHg) by EPA Method 5030GCFID
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) by EPA Method 8021
- MTBE by EPA Method 8021

The wells were constructed with 2-inch diameter solid PVC pipe from 0 to 5 feet bgs and with 0.010 inch slotted screen from 5 feet to the total depth. A traffic rated water tight access box was set in concrete with a 6-inch concrete skirt at the surface. The annular space was filled with #2/16 sand from 4 to the total depth feet bgs, hydrated bentonite chips from 3 to 4 feet bgs, and cement grout to grade. A locking cap was placed on the top of the well casing inside the access box.

The wells were developed on April 11, 2000, using a close inside diameter surge block and low-flow pumping. The top of each well casing was surveyed to the nearest 0.01 feet mean sea level relative to a temporary benchmark under direction of a licensed surveyor. Elevation of the temporary benchmark will be surveyed relative to a benchmark of known elevation shortly.

Initial groundwater samples were collected on April 12, 2000. Prior to purging and sampling, depth to water measurements were collected. Groundwater samples were collected with 1/2-inch disposable bailers.

Groundwater samples were kept cold and submitted to NCL for analysis of:

- Total Petroleum Hydrocarbons as Gasoline (TPHg) by EPA Method 8015B
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) by EPA Method 8260B
- MTBE, TAME, ETBE, DIPE, and TBA by EPA Method 8260B
- Lead Scavengers by EPA Method 8260B

LABORATORY RESULTS (See attached tables)

Soil Analyses-Borings:

Moderate to high concentrations of TPHg (210 to 3100 µg/g) were reported for soil samples collected (Figure 3) between 10 and 15 feet bgs in B1-00, B2-00, and B7-00. Low concentrations of TPHg (4.2 to 38 µg/g) were reported for samples collected at 5 feet bgs in B1-00, B6-00, and B7-00.

Moderate to high concentrations of total xylenes (42.1 to 216 µg/g) were reported for soil samples collected between 10 and 15 feet bgs in B1-00 and B7-00. Low concentrations of total xylenes (0.70 to 2.31 µg/g) were reported for samples collected between 3 and 5 feet bgs in B1-00, B6-00 and B7-00, and at 10 feet bgs in B2-00.

Low concentrations of ethylbenzene (0.77 to 31 µg/g) were reported for samples collected between 10 and 15 feet bgs in B1-00, B2-00, and B7-00. Very low concentrations of ethylbenzene (0.15 to 0.42 µg/g) were reported for samples collected between 3 and 5 feet bgs in B1-00, B6-00, and B7-00.

Low concentrations of toluene (0.10 to 22 µg/g) were reported for soil samples collected at 13 feet bgs in B1-00, and between 3 and 5 feet bgs in B1-00, B6-00, and B7-00.

Low concentrations of benzene (5.2 and 6.1 µg/g) were reported for soil samples collected between 10 and 15 feet bgs in B1-00. Very low concentrations of benzene (0.030 and 0.069 µg/g) were reported for samples collected between 3 and 5 feet bgs in B1-00, B6-00 and B7-00.

A low concentration of MTBE was reported for the sample collected at 5 feet bgs in B1-00. The laboratory suggests positive confirmation of the MTBE result by GC-MS.

The laboratory reported the detection limit was raised for several soil samples due to matrix interference. No other analyte concentrations above the standard detection limits were reported for the soil samples collected during installation of the borings.

Soil Analyses-Monitoring Wells:

Low concentrations of TPHg (11 µg/g and 1.3 µg/g) were reported for the samples collected at 7 and 15 feet bgs in MW-2. A low concentration of total xylenes (0.074 µg/g) was also reported for the sample collected at 7 feet bgs in MW-2.

No other analyte concentrations above the standard detection limits were reported for the soil samples collected during installation of the monitoring wells.

Distribution of soil contamination on the site is discussed later in this report. Laboratory results of soil samples are summarized in Table 1.

Groundwater Analyses-Borings:

High concentrations of TPHg (Figure 4) were reported for water samples from B-1 (60,000 µg/L), B-2 (21,000 µg/L), B-6 (23,000 µg/L) and B-7 (49,000 µg/L), and low concentrations of TPHg were reported for the sample from B-3 (170 µg/L), B-4 (230 µg/L), B-5 (78 µg/L), and B-8 (340 µg/L).

High concentrations of xylenes (Figure 5) were reported for water samples from B-1 (16,100 µg/L), B-2 (1,677 µg/L), B-6 (3,230 µg/L) and B-7 (12,500 µg/L), and low concentrations of xylenes were reported for samples from B-3 (1.1 µg/L) and B-8 (9.8 µg/L).

High concentrations of ethylbenzene were reported for water samples from B-1 (2,900 µg/L), B-2 (660 µg/L), B-6 (600 µg/L), and B-7 (2,100 µg/L), and low concentrations of ethylbenzene were reported for B-8 (0.98 µg/L).

Low concentrations of benzene (Figure 6) were reported for water samples from B-7 (34 µg/L) and B-6 (9.0 µg/L).

Detectable concentrations of toluene (0.55 to 3,700 µg/L) were reported for water samples from B-1, B-2, B-6, B7, and B-8.

Detectable concentrations of MTBE (Figure 7; 1.7 to 110 µg/L) were reported for samples from B-1, B-2, B-5, B-6, and B-8.

The laboratory reported no other analyte concentrations above the standard detection limits in groundwater samples from the borings. Distribution of groundwater contamination on the site is discussed later in this report.

Groundwater Analyses-Monitoring Wells:

Low concentrations of TPHg (120 to 280 µg/L) were reported for water samples collected from the monitoring wells on site (MW-1 through MW-3).

The laboratory reported no other analyte concentrations above the standard detection limits in groundwater samples from the monitoring wells.

Groundwater results are summarized in Tables 2 and 3. Original laboratory reports for this stage of the investigation are attached (Attachment 2).

DISCUSSION

Hydrogeology:

A groundwater gradient map is presented as Figure 2. Groundwater gradient, based on depth to water measured in the borings and monitoring wells in April 2000, across the site appears to vary from gently towards the southwest along the eastern half of the site, to steeply towards the west along the western half of the site. The variation on groundwater gradient at the site may be caused by the presence of a step in the bedrock surface below the site and a former drainage immediately to the north. The site occupies the riser between two bedrock cut marine terraces. Bedrock beneath the eastern half of the site lies at approximately 15 feet bgs and drops greater than 20 feet bgs beneath the western half (see cross sections Figures 8 and 9). The overlying sediments deposits also slope gently to the west. Groundwater beneath the eastern half (bedrock 15 feet bgs) apparently flows to the southwest, while groundwater beneath the western half of the site apparently flows westerly. Stratigraphy at the site generally consists of 3 to 5 feet of fill underlain by loose light red brown silty fine sand to 8 feet bgs. Beneath the silty fine sand the facies changes to loose light gray brown fine sand to 12 feet bgs and medium dense blue gray silty well-graded sand to 15 feet. Below the silty well graded sand on the western half of the bedrock step is medium dense gray coarse sand. These deposits are typical of beach and near shore sediments preserved as uplifted terraces along the Pacific coastline.

Hydrocarbons

Soil: Based on laboratory results of soil samples collected during the UST closure and the well and boring installation, three secondary sources (contaminated soil) of TPHg contamination appear to remain on site. Location and extent are discussed below, and shown on Figure 3.

- One secondary source appears to be located between the ground-surface down to 15 feet bgs in the vicinity and west of the existing pump islands. The western and southern extent has not been delineated.
- Another secondary source appears to be located between 10 and 15 feet bgs to the southeast of the former UST cavity. The eastern extent has not been delineated.
- A third secondary source appears to be located west of the former UST cavity. The western extent has not been delineated.

Groundwater: Based on laboratory results from groundwater samples collected following the well and boring installation, petroleum hydrocarbons have impacted the groundwater beneath the site. The distribution of TPHg, benzene, total xylenes, and MTBE in groundwater is discussed. Representational isoplots are presented as Figures 4 through 7.

- The highest concentrations of TPHg (up to 60,000 µg/L) in groundwater were reported in samples collected west of the former USTs and pump islands, less than 20 feet from the down gradient margin of the site (B1-00 and B7-00). Detectable concentrations of TPHg may extend off site at this time.
- The highest concentrations of total xylenes in groundwater were reported in samples collected west of the former USTs and pump islands, 20 to 40 feet from the down gradient margin of the site (B1-00 and B7-00). Detectable concentrations of xylenes may extend off site at this time.
- The highest concentrations of MTBE (up to 110 µg/L) in groundwater were reported less than 20 feet from the down gradient margin of the site, west of the former USTs (B1-00). Detectable concentrations of MTBE may extend off site at this time.
- The highest concentration of benzene (up to 34 µg/L) in groundwater was reported west of the former pump islands less than 40 feet from down gradient margin of the site (B7-00). Detectable concentrations of benzene may possibly extend of site at this time.
- With the exception of the low concentration of TPHg in groundwater from MW-1, the distribution of hydrocarbon contamination in groundwater on site correlates with the presence and location of secondary sources discussed above. The contamination detected in groundwater from MW-1 may originate from an upgradient source.

CONCLUSIONS

1. Three significant secondary sources of TPHg contamination (soil) remain on site at this time.
2. The extent of secondary sources of TPHg contamination has not been delineated.
3. Groundwater on site has been impacted by hydrocarbons (TPHg, MTBE, BTEX).
4. Current groundwater gradient direction and slope on site appears to vary across the site from steeply to the west on the west side of the site, to southwesterly and gentle on the eastern side.
5. Detectable concentrations of TPHg, BTEX, and MTBE in groundwater may extend off site.

RECOMMENDATIONS

1. Installation of additional borings west of the site to determine the extent of soil and groundwater contamination originating from the site is recommended. Selected borings should include collection of a continuous soil core to aid in determination of site stratigraphy.
2. Installation of borings using hydropunch technology to collect depth discrete groundwater samples to aid in delineation of the vertical extent of contamination is recommended.
3. Installation of additional monitoring wells at the down gradient periphery of the groundwater plume is recommended.
4. Coordination of groundwater monitoring with the adjacent UST site to the east is recommended.

LIMITATIONS

LACO ASSOCIATES has conducted the services identified herein in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing in our area under similar conditions as this project. No other warranty or representation, expressed or implied, is included or intended for this document.

This report is an instrument of service of LACO ASSOCIATES and was prepared for and was intended for the exclusive use of Walsh Oil. The contents of this report may not be relied upon by any party other than Walsh Oil without the express written permission of LACO ASSOCIATES.

This report's findings are based on conditions that existed on the dates indicated and in the specific locations where samples were taken. The findings herein should not be relied on to precisely represent conditions at any other time or location.

ATTACHMENTS

Table 1	Soil Analytical Results-Borings and Wells
Table 2	Groundwater Analytical Results-Borings
Table 3	Well Data and Groundwater Analytical Results
Figure 1	Location Map
Figure 2	Groundwater Surface Elevations (April 2000)
Figure 3	TPHg in Soil @ 10 Feet BGS (April 2000)
Figure 4	TPHg Isoplot (April 2000)
Figure 5	T. Xylenes Groundwater Isoplot (April 2000)
Figure 6	Benzene Groundwater Isoplot (April 2000)
Figure 7	MTBE Groundwater Isoplot (April 2000)
Figure 8	Boring & Monitoring Well Locations
Attachment 1	Boring Logs (1-8)
Attachment 2	Lab Results

Table 1. Soil Analytical Results-Borings and Wells
Walsh One Stop Shop, 105 South Main St., Fort Bragg, CA
LACO No. 4598.01; CRWQCB Case No. 1TMC388

Sample Location	Sample Depth (feet)	Sample Date	TPH (g/g)	Benzene (µg/g)	Toluene (µg/g)	Ethylbenzene (µg/g)	Xylenes (µg/g)	MTBE (µg/g)
B1-00	5	04/06/00	4.2	0.03	0.1	0.15	0.7	0.15
	10	04/06/00	3100	5.2	ND<30	31	216	ND<5.0
	13	04/06/00	2200	6.1	22	19	130	ND<10
B2-00	5	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	10	04/06/00	2100	ND<2.0	ND<20	ND<15	ND<6-8	ND<3.0
	13	04/06/00	210	MD<0.040	ND<0.90	0.77	1.6	ND<0.05
B3-00	5	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	10	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	15	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
B4-00	5	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	10	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
B5-00	5	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	10	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
B6-00	3	04/06/00	38	0.069	ND<0.20	0.39	2.31	ND<0.05
	5	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	15	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
B7-00	5	04/06/00	29	0.038	0.21	0.42	1.66	ND<0.05
	10	04/06/00	2800	ND<4.0	ND<20	12	87	ND<4.0
	15	04/06/00	1200	ND<3.0	ND<10	6.5	42.1	ND<0.05
B8-00	4	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	7	04/06/00	140	ND<0.005	ND<0.40	ND<1.0	ND<0.4-2.0	ND<0.05
	10	04/06/00	8	ND<0.005	ND<0.070	ND<0.020	ND<0.40-0.1	ND<0.05
	15	04/06/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05

Table 1. Soil Analytical Results-Borings and Wells
Walsh One Stop Shop, 105 South Main St., Fort Bragg, CA
LACO No. 4598.01; CRWQCB Case No. 1TMC388

Sample Location	Sample Depth (feet)	Sample Date	TPHg (µg/g)	Benzene (µg/g)	Toluene (µg/g)	Ethylbenzene (µg/g)	Xylenes (µg/g)	MTBE (µg/g)
MW-1	5	04/07/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	10	04/07/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	15	04/07/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
MW-2	5	04/07/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	7	04/07/00	11	ND<0.005	ND<0.030	ND<0.020	0.074	ND<0.05
	10	04/07/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	15	04/07/00	13	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
MW-3	5	04/07/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	10	04/07/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	15	04/07/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05
	20	04/07/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.05

Table 2. Groundwater Analytical Results-Borings
Walsh One Stop Shop, 105 South Main St., Fort Bragg, CA
LACO No. 4598.01; CRQWCB Case. No. 1TMC388

Sample Number	Sample Date	TPH (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Xylenes (µg/l)	MTBE (µg/L)	Other Analytes (µg/l)
B1-00	04/07/00	60000	ND<40	3700	2900	16100	110	ND<40-2000
B2-00	04/07/00	21000	ND<4.0	6.3	660	1677	36	ND<10-200
B3-00	04/07/00	170	ND<0.50	ND<0.50	ND<0.50	1.1	24	ND<1.0-10
B4-00	04/07/00	230	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-10
B5-00	04/07/00	78	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-10
B6-00	04/07/00	23000	9	180	600	3230	21	ND<13-250
B7-00	04/07/00	49000	34	750	2100	12500	ND<20	ND<20-1000
B8-00	04/07/00	340	ND<0.50	0.55	0.98	9.8	1.7	ND<1.0-10

TABLE 3. WELL DATA AND GROUNDWATER ANALYTICAL RESULTS

Walsh One Stop Shop, 105 South Main St, Fort Bragg, CA

LACO No. 4598.01; CRWQCB Case No. 1TMC388

Groundwater Measurements				Analytical Results						
WELL	Well Head	Groundwater	Depth to	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Other Analytes
Sample Date	Elevation (feet msl)	Elevation (feet msl)	Water (feet)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)
			mcl/(al)	---	1.0	150	700	1,750	(35)	
			tot	5	170	42	29	17	---	
MW-1	69.37	61.23	8.14	120	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50-50
MW-2	68.61	60.85	7.76	230	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50-50
MW-3	67.70	61.09	6.61	280	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50-50

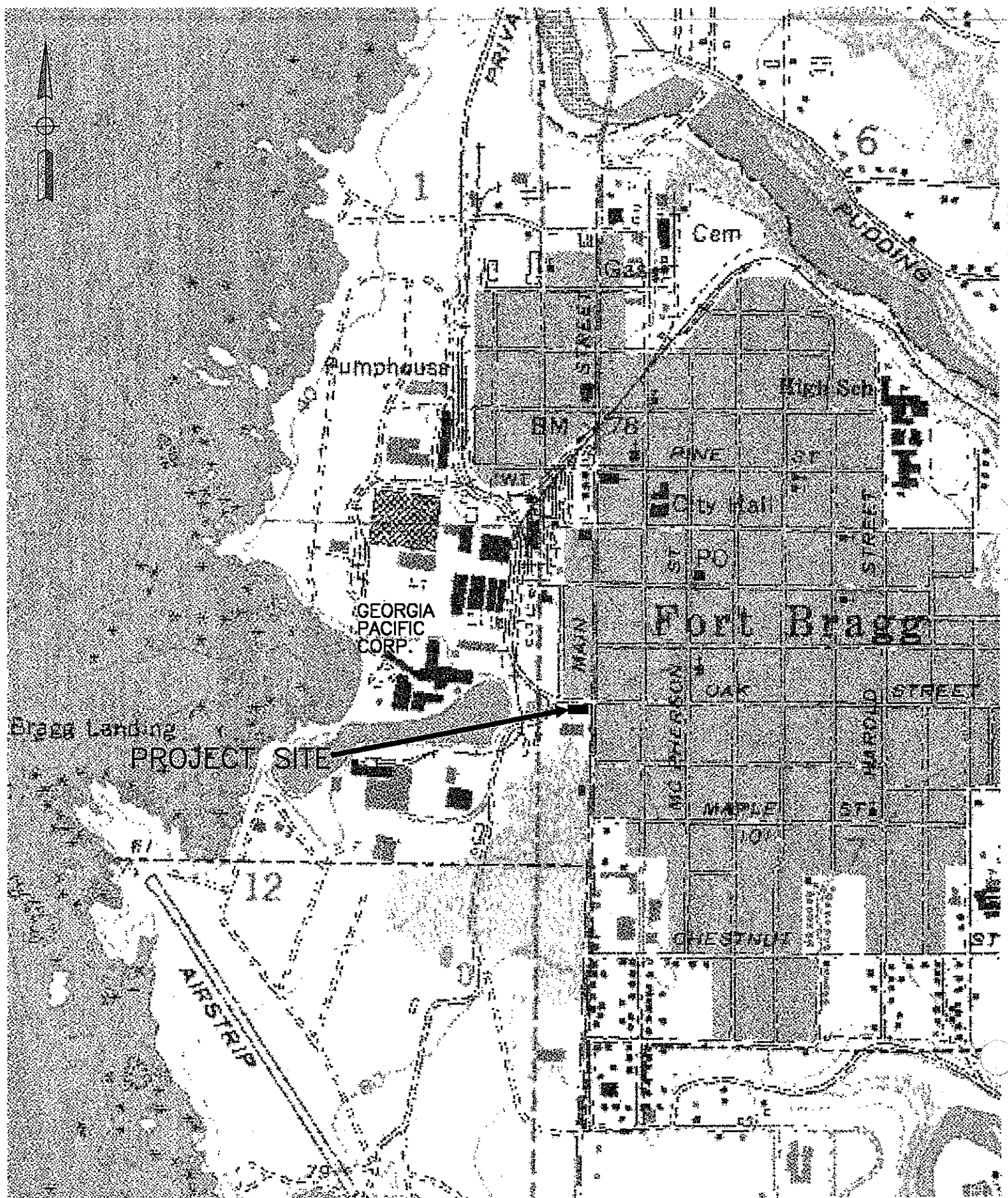


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PROJECT	REPORT OF FINDINGS
CLIENT	WALSH OIL COMPANY
LOCATION	ONE STOP SHELL, 105 S.MAIN, FORT BRAGG
	LOCATION MAP

BY	CMF
DATE	5/24/00
CHECK	
SCALE	1"=1000'

FIGURE	1
JOB NO.	4598





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PROJECT	REPORT OF FINDINGS	BY	BJI	FIGURE	2
CLIENT	WALSH OIL COMPANY	DATE	5/16/00	JOB NO.	4598
LOCATION	ONE STOP SHELL, 105 S.MAIN, FORT BRAGG	CHECK			
	GROUNDWATER SURFACE ELEVATIONS (APRIL 2000)	SCALE	1"=20'		

OAK STREET

EXISTING BUILDING

EXISTING BUILDING

MAIN STREET

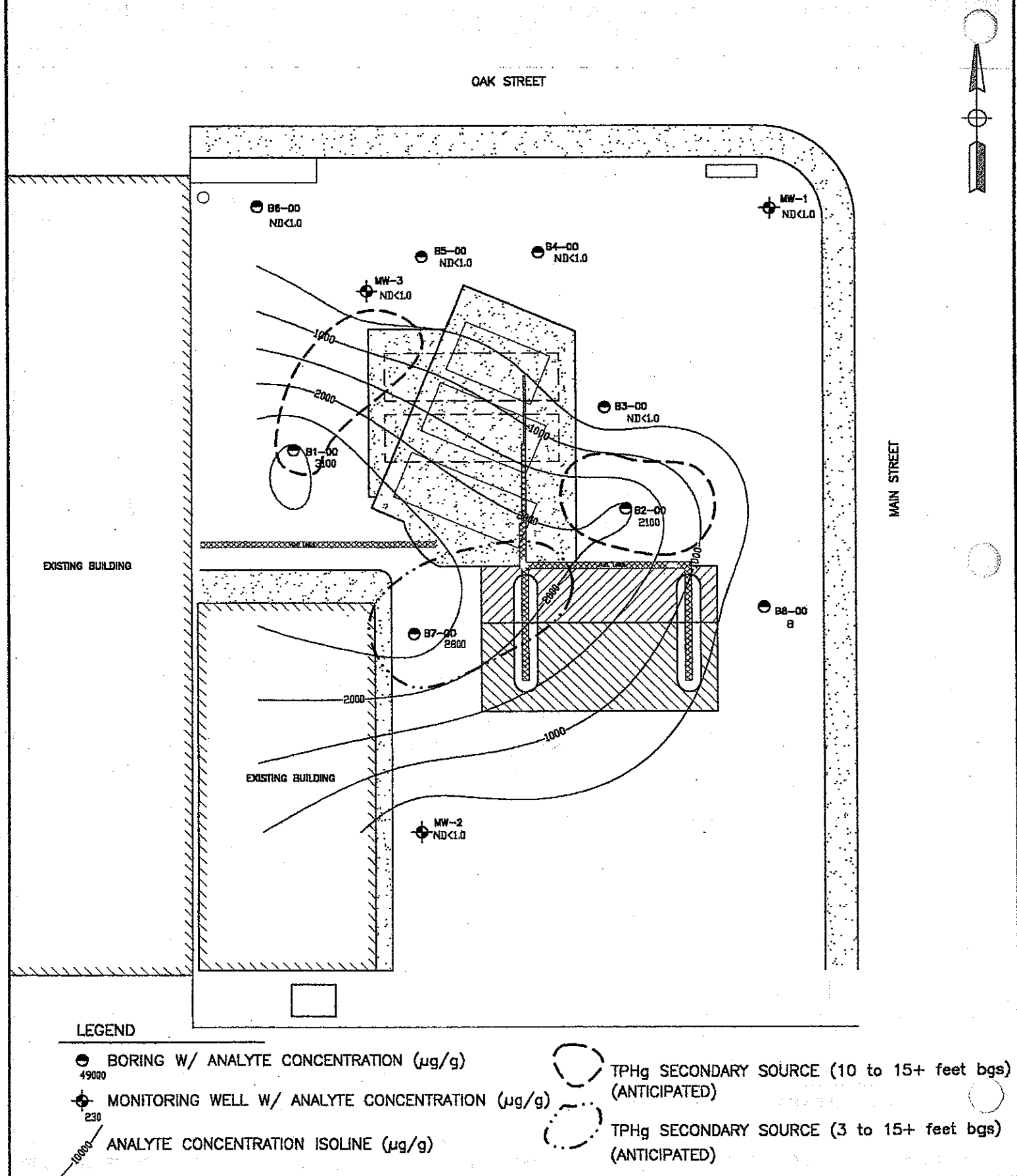
LEGEND

- BORINGS w/GROUNDWATER SURFACE ELEVATIONS
- MONITORING WELLS w/GROUNDWATER SURFACE ELEVATIONS
- BORING GROUNDWATER SURFACE CONTOUR
- MONITORING WELL GROUNDWATER SURFACE CONTOUR



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PROJECT	REPORT OF FINDINGS	BY	BJI	FIGURE	3
CLIENT	WALSH OIL COMPANY	DATE	7/11/00	JOB NO.	4598
LOCATION	ONE STOP SHELL, 105 S.MAIN, FORT BRAGG	CHECK			
	TPHg in SOIL @ 10 FEET BGS (APRIL 2000)	SCALE	1"=20'		





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PROJECT	REPORT OF FINDINGS	BY	BJI	FIGURE	4
CLIENT	WALSH OIL COMPANY	DATE	5/16/00	JOB NO.	4598
LOCATION	ONE STOP SHELL, 105 S.MAIN, FORT BRAGG	CHECK			
	TPHg GROUNDWATER ISOPLLOT (APRIL 2000)	SCALE	1"=20'		

OAK STREET

MAIN STREET

EXISTING BUILDING

EXISTING BUILDING

LEGEND

● BORING W/ ANALYTE CONCENTRATION ($\mu\text{g/L}$)

49000

⊕ MONITORING WELL W/ ANALYTE CONCENTRATION ($\mu\text{g/L}$)

230

— ANALYTE CONCENTRATION ISOLINE ($\mu\text{g/L}$)

10000





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CONSULTING ENGINEERS
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PROJECT	REPORT OF FINDINGS	BY	BJI	FIGURE	5
CLIENT	WALSH OIL COMPANY	DATE	5/16/00	JOB NO.	4598
LOCATION	ONE STOP SHELL, 105 S.MAIN, FORT BRAGG	CHECKED			
	T. XYLENES GROUNDWATER ISOPLOT (APRIL 2000)	SCALE	1"=20'		

OAK STREET

MAIN STREET

EXISTING BUILDING

EXISTING BUILDING

LEGEND

● BORING W/ ANALYTE CONCENTRATION ($\mu\text{g/L}$)

49000

⊕ MONITORING WELL W/ ANALYTE CONCENTRATION ($\mu\text{g/L}$)

230

— ANALYTE CONCENTRATION ISOLINE ($\mu\text{g/L}$)

10000





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CONSULTING ENGINEERS

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PROJECT	REPORT OF FINDINGS	BY	BJI	FIGURE	6
CLIENT	WALSH OIL COMPANY	DATE	5/16/00	JOB NO.	4598
LOCATION	ONE STOP SHELL, 105 S.MAIN, FORT BRAGG	CHECK	<input checked="" type="checkbox"/>		
	BENZENE GROUNDWATER ISOPLOT (APRIL 2000)	SCALE	1"=20'		

OAK STREET

MAIN STREET

EXISTING BUILDING

EXISTING BUILDING

LEGEND

● BORING W/ ANALYTE CONCENTRATION ($\mu\text{g/L}$)

49000

⊕ MONITORING WELL W/ ANALYTE CONCENTRATION ($\mu\text{g/L}$)

230

— ANALYTE CONCENTRATION ISOLINE ($\mu\text{g/L}$)

10000



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CONSULTING ENGINEERS

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PROJECT

REPORT OF FINDINGS

CLIENT

WALSH OIL COMPANY

LOCATION

ONE STOP SHELL, 105 S.MAIN, FORT BRAGG

MTBE GROUNDWATER ISOPLLOT (APRIL 2000)

BY BJI

DATE 5/16/00

CHECK *[Signature]*

SCALE 1"=20'

FIGURE

7

JOB NO.

4598

OAK STREET

MAIN STREET

EXISTING BUILDING

EXISTING BUILDING

LEGEND

● BORING W/ ANALYTE CONCENTRATION ($\mu\text{g/L}$)

49000

⊕ MONITORING WELL W/ ANALYTE CONCENTRATION ($\mu\text{g/L}$)

230

— ANALYTE CONCENTRATION ISOLINE ($\mu\text{g/L}$)

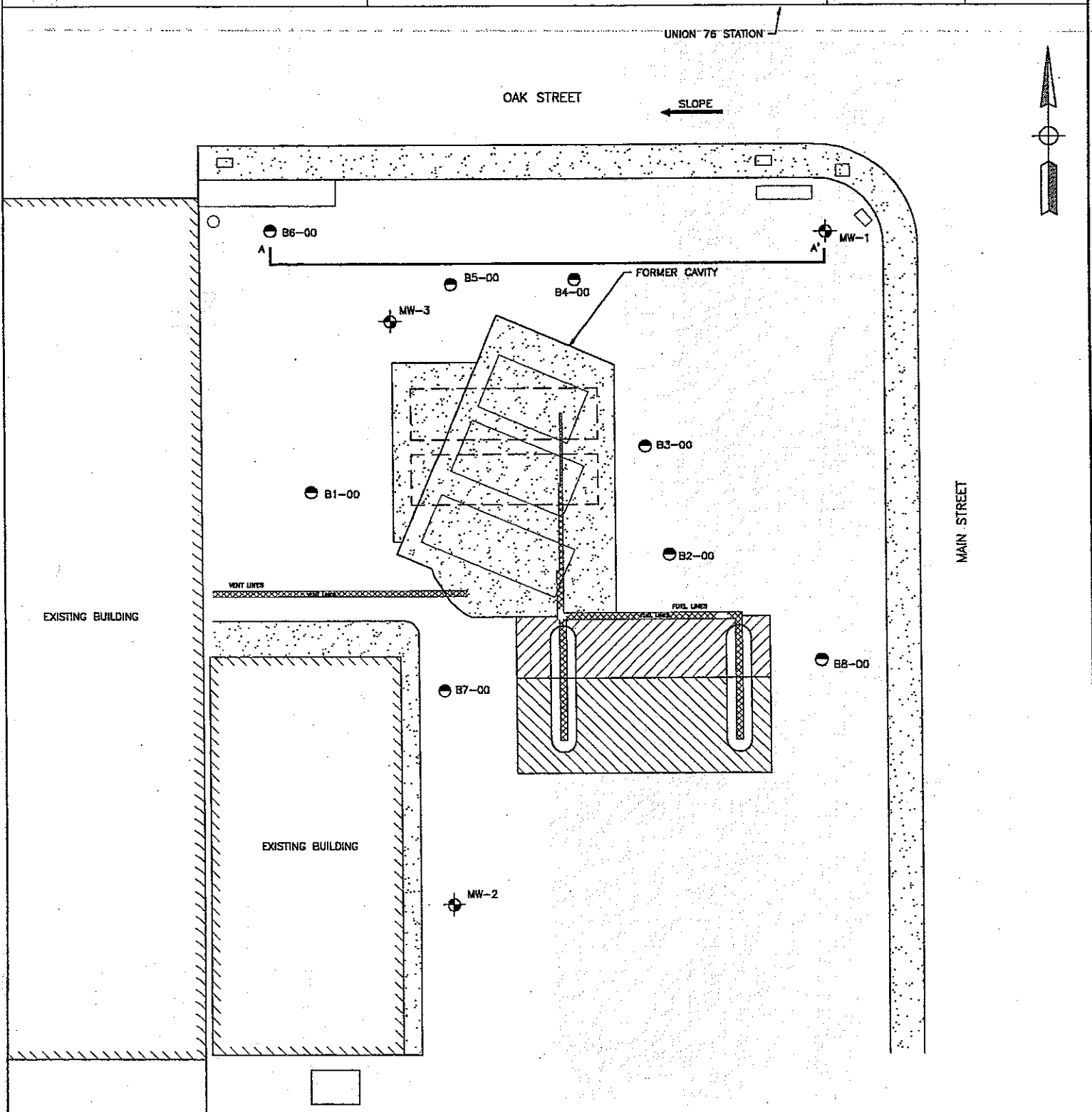
10000





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21 W 4TH ST. EUREKA, CA 95501 (707)443-5054

PROJECT	REPORT OF FINDINGS	BY	BJI	FIGURE	8
CLIENT	WALSH OIL COMPANY	DATE	5/16/00	JOB NO.	4598
LOCATION	ONE STOP SHELL, 105 S.MAIN, FORT BRAGG	CHECK	<input checked="" type="checkbox"/>		
	CROSS- SECTION LINE A-A'	SCALE	1"=20'		



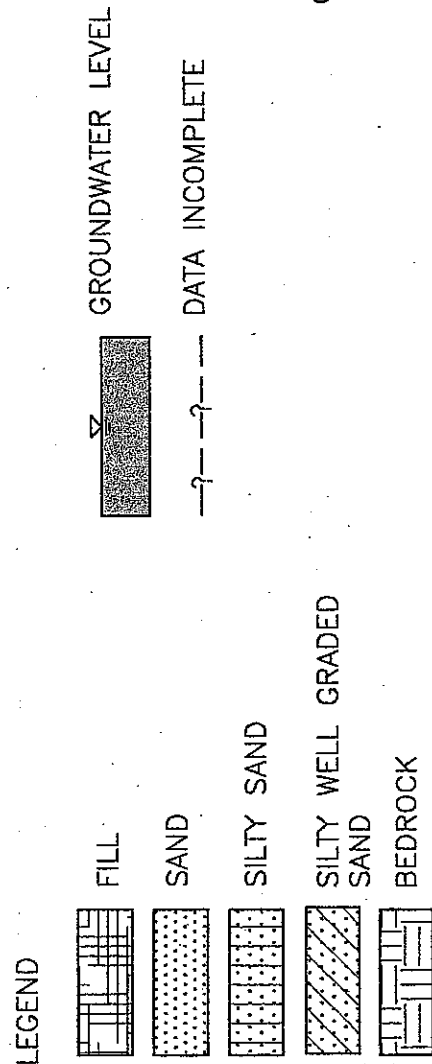
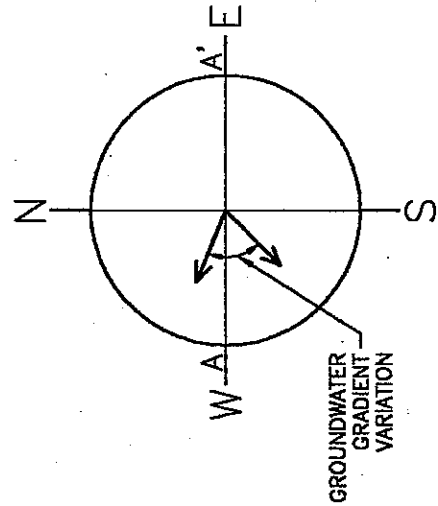
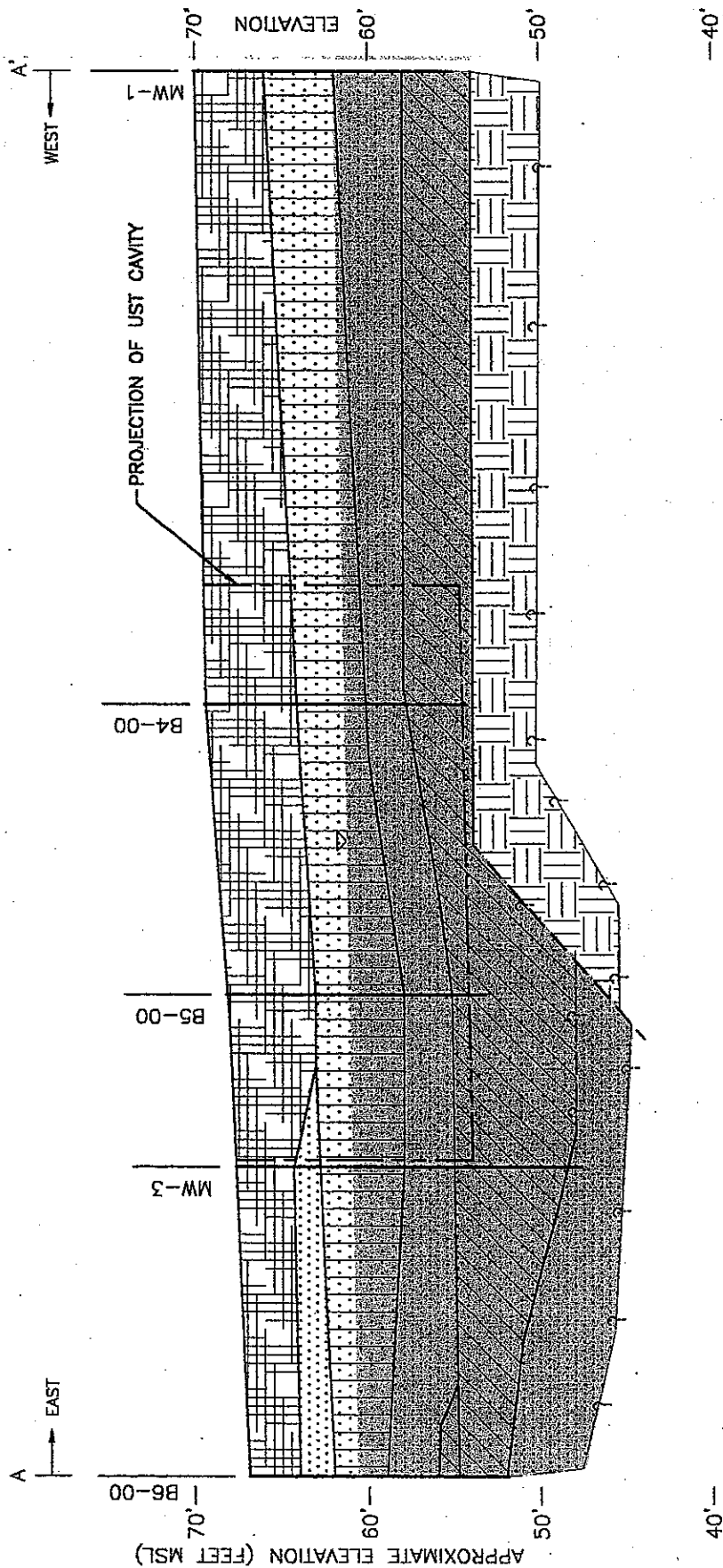
LEGEND

- BORINGS
- ⊕ MONITORING WELLS
- FORMER UST
- ▭ NEW UST



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PROJECT	INITIAL SUBSURFACE INVESTIGATION	BY	BAB	FIGURE	9
CLIENT	CLARENCE WALSH	DATE	6/30/00	JOB NO.	4598.01
LOCATION	ONE-STOP SHOP, FT. BRAGG	CHECK			
	CROSS SECTION A-A'	SCALE	1"=10'		



ATTACHMENT 1

BORING LOG

Boring No. B1-00

PROJECT: WALSH OIL COMPANY
 BORING LOCATION: WEST OF USTs
 DRILLING METHOD: 4-INCH RSFA
 DRILLER: CLEAR HEART

PROJECT NO.: 4598.01
 DATE: 4/6/00
 ELEVATION: 48.73 FEET (TBM)
 LOGGED BY: CJW

DEPTH TO WATER: INITIAL ∇ : 7.5 FEET COMPLETION ∇ : 8.19 FEET
 SITE GEOLOGY: MARINE TERRACE

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D. ppm	Hanby result
0			A/C.		
			AGGREGATE BASE.	0	
47.5			GRAVELLY SILTY SAND (FILL); Red Brown, medium dense, dry, 20% silt, 60% fine sand, 20% fine gravel. No hydrocarbon odor or staining.		
2.5					
45					
5			Hydrocarbon odor.		
42.5		SP	POORLY GRADED SAND; Black, medium dense, dry, 100% fine sand. Hydrocarbon odor.	1396	
7.5		SP	POORLY GRADED SAND; Gray, loose, saturated, 100% fine sand. Hydrocarbon odor.	10000	
40					
10					
37.5		SP	POORLY GRADED SAND; Gray, loose, saturated, 100% medium sand. Hydrocarbon odor.		
12.5					
35		SM	SILTY SAND WITH GRAVEL; Blue Gray, medium dense, saturated, 5% clay, 10% silt, 35% well graded sand, 35% fine gravel. Hydrocarbon odor.	5000	
15			Halt at 15'. Hydrocarbon odor.		
32.5					
17.5					
30					

2" PVC to 13', SCREEN 3' to 13'.

BORING LOG

Boring No. B2-00

PROJECT: WALSH OIL COMPANY
 BORING LOCATION: SOUTHEAST OF USTs
 DRILLING METHOD: 4-INCH RSFA
 DRILLER: CLEAR HEART
 DEPTH TO WATER: INITIAL ∇ : 8 FEET
 SITE GEOLOGY: MARINE TERRACE

PROJECT NO.: 4598.01
 DATE: 4/6/00
 ELEVATION: 49.11 FEET (TBM)
 LOGGED BY: CJW

COMPLETION ∇ : 8.17 FEET

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D. ppm	Hanby result
0			A/C.		
47.5			AGGREGATE BASE.		
2.5			FILL.		
45		SP	POORLY GRADED SAND; Gray Black, loose, wet, 100% fine sand. No hydrocarbon odor or staining.	0	
5		SP	POORLY GRADED SAND; Red Brown, loose, wet, 100% fine sand. No hydrocarbon odor or staining.		
42.5					
7.5		SP	POORLY GRADED SAND; Yellow Brown, loose, saturated, 100% fine sand. Hydrocarbon odor.	1157	
40					
10		SP	POORLY GRADED SAND; Light Gray, loose, saturated, 100% fine sand. Hydrocarbon odor.		
37.5					
12.5					
35			Halt at 14'. Hydrocarbon odor.		
15					
32.5					
17.5					

2" PVC to 13', SCREEN 3' to 13'.

BORING LOG

Boring No. **B3-00**

PROJECT: WALSH OIL COMPANY
 BORING LOCATION: EAST OF USTs
 DRILLING METHOD: 4-INCH RSFA
 DRILLER: CLEAR HEART
 DEPTH TO WATER: INITIAL ∇ 7.5 FEET
 SITE GEOLOGY: MARINE TERRACE

PROJECT NO.: 4598.01
 DATE: 4/6/00
 ELEVATION: 49.11 FEET (TBM)
 LOGGED BY: CJW

COMPLETION ∇ : 8.35 FEET

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D. ppm	Hanby result
0			A/C.		
47.5			AGGREGATE BASE.		
2.5			FILL.		
45					
5		SP	POORLY GRADED SAND; Gray Black, loose, dry, 100% fine sand. No hydrocarbon odor or staining.	0	
42.5					
7.5		SP	POORLY GRADED SAND; Red Brown, loose, saturated fine sand. No hydrocarbon odor or staining.		
40					
10		SP	POORLY GRADED SAND; Light Gray, loose, saturated, 100% medium sand. No hydrocarbon odor or staining.	0	
37.5					
12.5					
35			Halt at 14'. Hydrocarbon odor.		
15					
32.5					
17.5					

2" PVC to 14', SCREEN 4' to 14'.

BORING LOG

Boring No. **B4-00**

PROJECT: WALSH OIL COMPANY
BORING LOCATION: WEST OF USTs
DRILLING METHOD: 4-INCH RSFA
DRILLER: CLEAR HEART

PROJECT NO.: 4598.01
DATE: 4/6/00
ELEVATION: 48.99 FEET (TBM)
LOGGED BY: CJW

DEPTH TO WATER: INITIAL ∇ : 8 FEET
SITE GEOLOGY: MARINE TERRACE

COMPLETION ∇ : 8.24 FEET

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D. ppm	Hanby result
0			A/C.		
			AGGREGATE BASE.	0	
47.5			GRAVELLY SILTY SAND (FILL); Red Brown, medium dense, dry, 20% silt, 60% fine sand, 20% fine gravel. No hydrocarbon odor or staining.		
2.5					
45					
5		SP-SM	POORLY GRADED SAND WITH SILT; Light Red Brown, medium dense, wet, 10 silt, 90% fine sand. No hydrocarbon odor or staining.	0	
42.5					
7.5					
40					
10			Saturated. No hydrocarbon odor or staining.		
37.5		SP	POORLY GRADED SAND; Light Gray, loose, saturated, 100% medium sand. No hydrocarbon odor or staining.	0	
12.5					
35		SM	SILTY SAND WITH GRAVEL; Blue Gray, medium dense, saturated, 5% clay, 10% silt, 35% well graded sand, 35% fine gravel. No hydrocarbon odor or staining.		
15			Halt at 15'. No hydrocarbon odor or staining.	0	
32.5					
17.5					

2" PVC to 15', SCREEN 5' to 15'.

BORING LOG

Boring No. **B5-00**

PROJECT: WALSH OIL COMPANY
BORING LOCATION: NORTH OF USTs
DRILLING METHOD: 4-INCH RSFA
DRILLER: CLEAR HEART

PROJECT NO.: 4598.01
DATE: 4/6/00
ELEVATION: 48.99 FEET (TBM)
LOGGED BY: CJW

DEPTH TO WATER: INITIAL ∇ : 8 FEET COMPLETION ∇ : 7.65 FEET
SITE GEOLOGY: MARINE TERRACE

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D. ppm	Hanby result
0			A/C.		
			AGGREGATE BASE.		
47.5			GRAVELLY SILTY SAND (FILL); Red Brown, medium dense, dry, 20% silt, 60% fine sand, 20% fine gravel. No hydrocarbon odor or staining.		
2.5			No hydrocarbon odor or staining.		
45					
5					
42.5		SP-SM	POORLY GRADED SAND WITH SILT; Light Red Brown, medium dense, dry, 10 silt, 90% fine sand. No hydrocarbon odor or staining.	0	
7.5					
40					
10		SP	POORLY GRADED SAND; Light Gray, loose, saturated, 100% medium sand. No hydrocarbon odor or staining.	0	
37.5					
12.5					
35		SM	SILTY SAND WITH GRAVEL; Blue Gray, medium dense, saturated, 5% clay, 10% silt, 35% well graded sand, 35% fine gravel. No hydrocarbon odor or staining.		
15			Halt at 15'. No hydrocarbon odor or staining.		
32.5					
17.5					

2" PVC to 15', SCREEN 5' to 15'.

BORING LOG

Boring No. **B6-00**

PROJECT: WALSH OIL COMPANY
 BORING LOCATION: NORTHWEST OF USTs
 DRILLING METHOD: 4-INCH RSFA
 DRILLER: CLEAR HEART
 DEPTH TO WATER: INITIAL ∇ : 8 FEET
 SITE GEOLOGY: MARINE TERRACE

PROJECT NO.: 4598.01
 DATE: 4/6/00
 ELEVATION: 46.46 FEET (TBM)
 LOGGED BY: CJW
 COMPLETION ∇ : 6.68 FEET

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D. ppm	Hanby result
0			A/C.		
			AGGREGATE BASE.		
45			GRAVELLY SILTY SAND (FILL); Red Brown, medium dense, dry, 20% silt, 60% fine sand, 20% fine gravel. No hydrocarbon odor or staining.		
2.5			POORLY GRADED SAND; Black, dry, loose, 100% fine sand. Hydrocarbon odor.		
42.5			Hydrocarbon odor.		
5		SP-SM	POORLY GRADED SAND WITH SILT; Light Red Brown, medium dense, moist, 10 silt, 90% fine sand. No hydrocarbon odor or staining.	0	
40					
7.5		SP	POORLY GRADED SAND; Gray, loose, saturated, 100% fine sand. Hydrocarbon odor.	7000	
37.5					
10					
35		SP-SC	POORLY GRADED SAND WITH CLAY; Gray, medium dense, saturated, 100% medium sand. Hydrocarbon odor.		
12.5		SM	SILTY SAND WITH GRAVEL; Blue Gray, medium dense, saturated, 5% clay, 10% silt, 35% well graded sand, 35% fine gravel. Hydrocarbon odor.	5000	
32.5					
15			POORLY GRADED SAND; Gray, medium dense, saturated, 100% coarse sand. Hydrocarbon odor.		
30					
17.5					

2" PVC to 14', SCREEN 4' to 14'.

BORING LOG

Boring No. **B7-00**

PROJECT: WALSH OIL COMPANY
BORING LOCATION: WEST OF PUMP ISLANDS
DRILLING METHOD: 4-INCH RSFA
DRILLER: CLEAR HEART
DEPTH TO WATER: INITIAL ∇ : 8 FEET
SITE GEOLOGY: MARINE TERRACE

PROJECT NO.: 4598.01
DATE: 4/6/00
ELEVATION: 48.96 FEET (TBM)
LOGGED BY: CJW

COMPLETION ∇ : 8.27 FEET

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D. ppm	Hanby result
0			A/C.		
			AGGREGATE BASE.		
47.5			GRAVELLY SILTY SAND (FILL); Red Brown, medium dense, dry, 20% silt, 60% fine sand, 20% fine gravel. No hydrocarbon odor or staining.		
2.5					
45					
5			Hydrocarbon odor.		
42.5		SP	POORLY GRADED SAND; Black, medium dense, dry, 100% fine sand. Hydrocarbon odor.		
7.5					
		SP-SC	POORLY GRADED SAND WITH SILT; Gray, medium dense, saturated, 10 silt, 90% fine sand. Hydrocarbon odor.	9000	
40					
10			Hydrocarbon odor.		
37.5		SP	POORLY GRADED SAND; Gray, medium dense, saturated, 100% medium sand. Hydrocarbon odor.		
12.5					
35					
15			Halt at 15'. Hydrocarbon odor.		
32.5					
17.5					

2" PVC to 15', SCREEN 5' to 15'.

BORING LOG

Boring No. **B8-00**

PROJECT: WALSH OIL COMPANY
 BORING LOCATION: EAST OF PUMP ISLAND
 DRILLING METHOD: 4-INCH RSFA
 DRILLER: CLEAR HEART
 DEPTH TO WATER: INITIAL ∇ : 7 FEET
 SITE GEOLOGY: MARINE TERRACE

PROJECT NO.: 4598.01
 DATE: 4/6/00
 ELEVATION: 48.99 FEET (TBM)
 LOGGED BY: CJW

COMPLETION ∇ : 8:22 FEET

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D. ppm	Hanby result
0			A/C.		
			AGGREGATE BASE.		
47.5			GRAVELLY SILTY SAND (FILL); Red Brown, medium dense, dry, 20% silt, 60% fine sand, 20% fine gravel. No hydrocarbon odor or staining.		
2.5		SP	POORLY GRADED SAND; Black, medium dense, dry, 100% fine sand. Hydrocarbon odor.		
45		SP-SM	POORLY GRADED SAND WITH SILT; Light Red Brown, wet, loose, 10% silt, 90% fine sand. No hydrocarbon odor or staining.	0	
5					
42.5					
7.5		SP	POORLY GRADED SAND; Gray, loose, saturated, 100% fine sand. Hydrocarbon odor.		
40		SP	POORLY GRADED SAND; Light Red Brown, medium dense saturated, 100% medium sand. Slight hydrocarbon odor.		
10					
37.5					
12.5					
35		SM	SILTY SAND WITH GRAVEL; Blue Gray, medium dense, saturated, 5% clay, 10% silt, 35% well graded sand, 35% fine gravel. Slight hydrocarbon odor. Halt at 15'. Slight hydrocarbon odor.		
15					
32.5		ROCK	BEDROCK		
17.5					

2" PVC to 15', SCREEN 5' to 15'.

MONITORING WELL LOG

Well No. **MW-1**

PROJECT: WALSH OIL COMPANY
BORING LOCATION: NE CORNER OF SITE
DRILLING METHOD: DEEP ROCK
DRILLER: CLEAR HEART

PROJECT NO.: 4598.01
DATE: 4/7/00
ELEVATION: 69.37 FEET (msl)
LOGGED BY: CJW

DEPTH TO WATER: INITIAL ∇ : 8 FEET

COMPLETION ∇ : 8.14 FEET

SITE GEOLOGY: MARINE TERRACE

WELL CASING: 2" PVC

WELL SCREEN AND INTERVAL: 10 SLOT; 5'-15'

SEAL AND INTERVAL: BENT/GROUT; 0'-4'

SAND PACK AND INTERVAL: 2/16; 4'-15'

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D ppm	Hanby Result	Well Construction Diagram
0			A/C.			
68			AGGREGATE BASE.			
			GRAVELLY SILTY SAND (FILL).			
4		SP	POORLY GRADED SAND; Black, loose, dry, 100% fine sand. Hydrocarbon odor.			
64		SP-SM	POORLY GRADED SAND WITH SILT; Light Red Brown, medium dense, wet, 10% silt, 90% fine sand. No hydrocarbon odor or staining.			
8		SP	POORLY GRADED SAND; Light red brown, medium dense, saturated, 100% fine sand. No hydrocarbon odor or staining.			
60						
12		SM	SILTY SAND WITH GRAVEL; Blue gray, medium dense, saturated, 5% clay, 10% silt, 35% well graded sand, 35% fine gravel. No hydrocarbon odor or staining.			
56						
16		ROCK	WEATHERED BED ROCK.			
52						
20						
48						
24						
44						
28						

MONITORING WELL LOG

Well No. **MW-2**

PROJECT: WALSH OIL COMPANY
BORING LOCATION: EAST OF STORE DOOR
DRILLING METHOD: DEEP ROCK
DRILLER: CLEAR HEART

PROJECT NO.: 4598.01
DATE: 4/7/00
ELEVATION: 68.61 FEET (msl)
LOGGED BY: CJW

DEPTH TO WATER: INITIAL ∇ 8 FEET COMPLETION ∇ : 7.76 FEET

SITE GEOLOGY: MARINE TERRACE

WELL CASING: 2" PVC

SEAL AND INTERVAL: BENT/GROUT; 0'-4'

WELL SCREEN AND INTERVAL: 10 SLOT; 5'-20'
SAND PACK AND INTERVAL: 2/16; 4'-20'

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D. ppm	Hanby Result	Well Construction Diagram
68 0			A/C.			
68			AGGREGATE BASE.			
68			GRAVELLY SILTY SAND (FILL).			
64						
64						
60		SP	POORLY GRADED SAND; Black, loose, dry, 100% fine sand. Hydrocarbon odor.			
60		SP	POORLY GRADED SAND; Light red brown, medium dense, saturated, 100% fine sand. Hydrocarbon odor.			
60			Hydrocarbon odor.			
56						
56						
52						
52						
48		SM	SILTY SAND WITH GRAVEL; Blue gray, medium dense, saturated, 5% clay, 10% silt, 35% well graded sand, 35% fine gravel. No hydrocarbon odor or staining.			
48			WELL GRADED SAND; Gray, dense, saturated, 100% well graded sand. No hydrocarbon odor or staining.			
44						
44						
28						

MONITORING WELL LOG

Well No. **MW-3**

PROJECT: WALSH OIL COMPANY

PROJECT NO.: 4598.01

BORING LOCATION: NORTHWEST OF FORMER UST CAVITY DATE: 4/7/00

DRILLING METHOD: DEEP ROCK

ELEVATION: 67.70 FEET (msl)

DRILLER: CLEAR HEART

LOGGED BY: CJW

DEPTH TO WATER: INITIAL ∇ : 8 FEET

COMPLETION ∇ : 6.61 FEET

SITE GEOLOGY: MARINE TERRACE

WELL CASING: 2" PVC

WELL SCREEN AND INTERVAL: 10 SLOT; 5'-20'

SEAL AND INTERVAL: BENT/GROUT; 0'-4'

SAND PACK AND INTERVAL: 2/16; 4'-20'

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D ppm	Hanby Result	Well Construction Diagram
0			A/C.			
			AGGREGATE BASE.			
			GRAVELLY SILTY SAND (FILL).			
64 4		SP	POORLY GRADED SAND; Black, loose, dry, 100% fine sand. Hydrocarbon odor.			
		SP	POORLY GRADED SAND WITH SILT; Light red brown, medium dense, saturated, 10% silt, 90% fine sand. No hydrocarbon odor or staining.			
60 8						
			POORLY GRADED SAND; Light gray, loose, saturated, 100% medium sand. No hydrocarbon odor or staining.			
56 12						
		SM	SILTY SAND WITH GRAVEL; Blue gray, medium dense, saturated, 5% clay, 10% silt, 35% well graded sand, 35% fine gravel. No hydrocarbon odor or staining. WITH ROOTS.			
52 16						
48 20						
			WELL GRADED SAND; Gray, dense, saturated, 100% well graded sand. No hydrocarbon odor or staining.			
44 24						
40 28						